THE ART OF WARRE, OR Militarie diſcourſes

¶ *Of leavying, marching, encamping; and embattailing an armie.*

¶ *Of building, defending, and expugning forts and fortified cities.*

¶ *Of ordinance, petards, and fireworks.*

¶ *Of the ſeverall duties of officers, and ſouldiers.*

¶ *Of the Grecian, and Romane* Militia, *and forming of battaillons*; &c.

BY

The Lord of PRAISSAC.

Engliſhed by I. C.

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[o]

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This tranſlation (intituled The Art of Warre, or Militarie diſcourſes by the Lord of Praiſſac) *may be imprinted.*

ARUNDEL *and* SURREY.

Imprimatur Cantabrigiæ.

Ra. Brownrigg *Procan.*
Sa. Collins.
L. Chaderton.
Tho. Bachcroft.

TO THE RIGHT HONOURABLE HENRIE Lord MATRAVERS, Lord Lieutenant of his Majesties forces in Norfolk and Norwich.

RIGHT HONOURABLE,

IT was the opinion of *Cato, Vel otii nostri reddendam esse rationem*; In conformitie whereunto I have lately spent some idle houres in bringing noble *du Praissac* to speak English. An excellent principall, as your Lordship (who are no stranger to the forrain tongues) will doubtlesse judge it, though but meanly coppied. Such as it is your Lordships many and continued favours, do embolden me (in all humble submission) to present it to your Lordship, and with it the bounden and dutifull service of

your Honours

devoted and obliged servant

JO. CRUSO.

TO THE GENTLEMEN OF the *Artillerie* and *Militarie companies* in this kingdome, and particularly of that in *Norwich*.

GENTLEMEN,

I *Here present you with the excellencies of the Lord of* Praissac, *together with mine own imperfections. For the exercising of a* Company *in their* postures *and* motions, *and to dispose that (or perhaps a* regiment*) into various forms of* battalia, *as there are divers* helps *extant (besides your commendable* practice*) so doubtlesse most of you have attained to very good perfection therein: yet I assure my self, your vertuous emulations will not suffer you to stick there, but will kindle a* plus oultre *in your heroick breasts; especially when you shall here see that you have much more to do, and that a souldiers* Gammaut *goes farre beyond* E-la.

These are times of action, *and require every true hearted subject to imploy his talent for his Majesties service and the publick safety; If these my poore endeavours may afford but the least furtherance thereunto, and my good intentions receive but a courteous acceptance at your hands, I have my desires; and rest*

Your servant

I. C

The ſubject of the book.

The ſubject of this book is the Art of Warre, which hath two parts, Preparation and action.

Preparation there muſt be of men, money, inſtruments, and victuall.

The action is performed in the field or in fortreſſes.

That which is performed in the field, conſidereth the marching, encamping, and embattailing of the armie.

And that of fortreſſes conſidereth their fabrick, guard, expugning, defence, and releef.

The generall heads have their particular dependences, being the common practices which are daily obſerved; as the examples, the figures, and the chapters following do ſhew.

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How

How a Prince is to prepare himself to make warre, to raise an armie, and the manner of marching.

Chap. I.

A Prince being resolved to make warre (be it offensive or defensive) ought to make such provision of men, instruments, money, and victuall, as he shall know to be necessary for his enterprise.

In making his provision of men, he is to choose such as are fit for counsell, for command, and for souldierie.

For his counsels, such whose age, prudence, experience and study renders capable of such imployments.

For commanders in his armies, he is to choose men of authoritie, respect, prudence, experience, and good fortune. Each of them having made such proof of their courage, sufficiencie, and good successe in their severall charges, as it be apparently known to all men; chiefly choosing such as are born courageous, and are habituated in all the exercises of warre: as, to handle all sorts of armes, to know all manner of militarie motions, to form all sorts of battaillons, to range armies in battalia, to make them march, encamp, embattaile, to erect fortifications, to assault places of strength, and to defend them, to make the trenches, and place the batteries; briefly, that they know all the functions of warre.

For ſouldiers (whether they be Infanterie or Cavallrie) they ought to be elected, ſuch as are ſtrong, ſtout, and of fitting yeares, giving them ſuch armes as are moſt fitting for them; and diſciplining them.

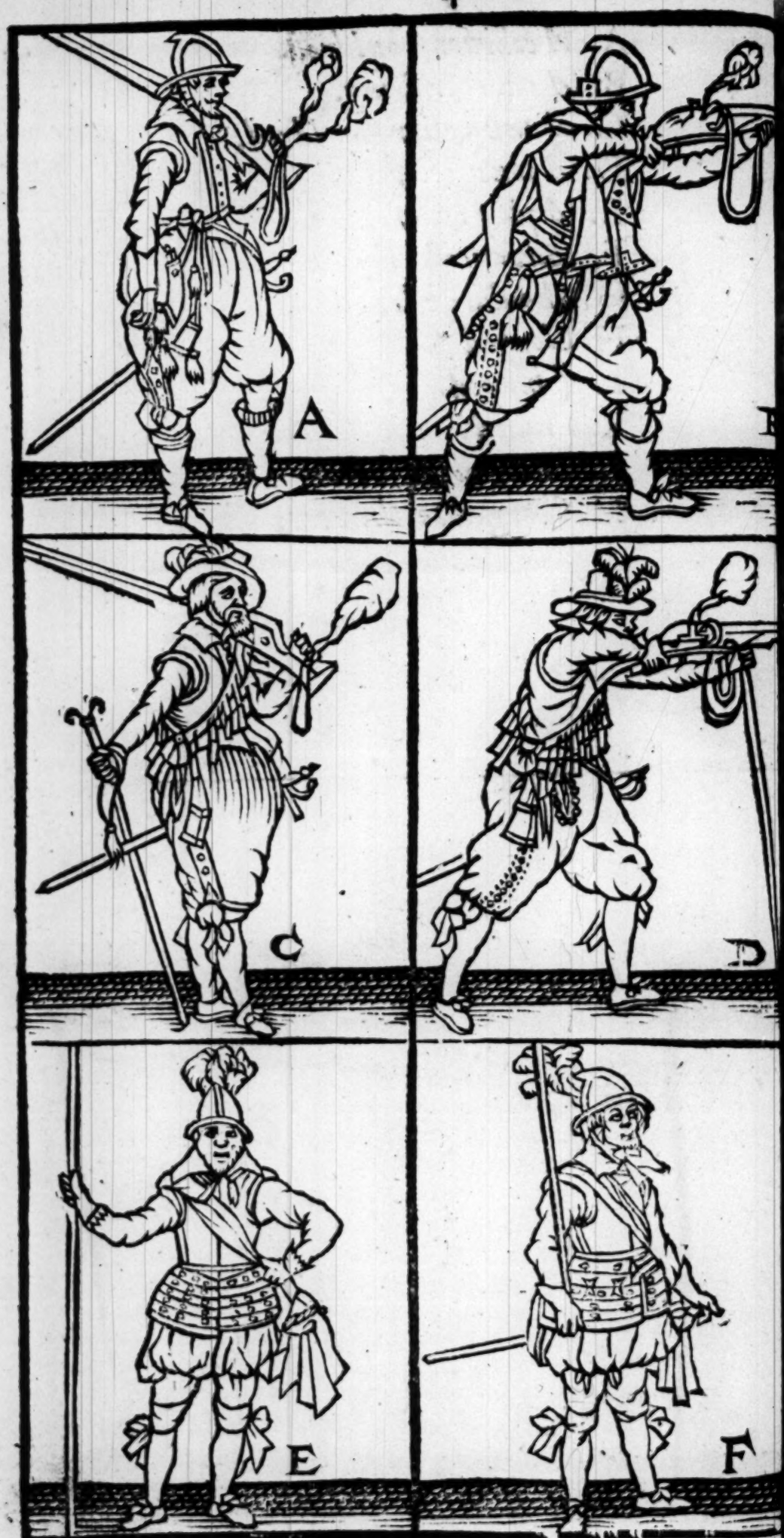
For the politick part, that they be ſober and continent in their ſuſtenance, abſtemious from play and women, modeſt in their ſpeeches, apparell, and all other actions.

Concerning the militarie part, they are to be inſtructed in the uſe and exerciſe of the ſword, musket, and pike; and to be taught how to encamp, entrench, and make their huts, how to keep themſelves in order, and to be expert in all motions requiſite for the forming and ready dividing of ſuch forms as ſhall be deſired. To this end the Captains, Lieutenants, and Enſignes ought to be very carefull to inſtruct and diſcipline their ſouldiers.

The militarie diſcipline for the foot is this; The musketiers ought to be exact in the uſe of their musket and reſt together, to ſhoulder properly, to make ready, and preſent all after one and the ſame manner, whether it be upon entring into the guard, to paſſe a muſter, or to go to the charge; To give fire, either by themſelves, by files, by ranks, or in a volly. The pikes to ſhoulder (aſloap and levell) advance, trail, charge to front and rear; And both pikes and muskets, how to wear their ſwords, how to keep their ranks and files, to take their diſtances, both for muſter and fight; To uſe their motions, to the right, left, and rear; To double, open, cloſe, and to reduce both files and ranks; to countermarch, and wheel.

A. *A calliver shouldred.*
B. *A calliver firing:*
C. *A musketier shouldred.*
D. *A musketier firing.*
E. *A pike ordered.*
F. *Advanced.*
G. *Shouldred levell.*
H. *Sloaped.*
I. *Charged.*
K. *Trailed.*
L. *Charged at foot.*
M. *Charged to the rear.*

The French continued the calliver longer then other nations.


A
B
C
D
E
F


G
H
I
K
L
M

Concerning the horſe, they ought to be i
ſtructed how to manage their horſes and arm
Their horſes to the right and left, to advance, ſto
retreat.

Their armes, how properly to put on a
wear their defenſive ones; and to make good u
of the offenſive, as how to charge and preſ
their carbines and piſtols, and to finde out the u
armed parts with their ſwords.

A troop of horſe being to be muſtered, marc
eth three in rank; but to be embattailed, it oug
to be ſo diſpoſed, that for every three in rank th
be one in file, ſo that a troop of 108 horſe ſh
have 18 files and 6 ranks.

. The diſtance of ranks ought to be (both for t
length of the horſe, as for the ſpaces betwe
them) of ſix [a] paces, and of files one pace.

To make one groſſe of many battaillons, t
troops ought to be ordered into ſo many ranks
the flank of the battaillon ſhall be intended
contain horſes, and then to draw up the troo
flank to flank.

The proviſion of inſtruments of warre is pri
cipally of armes and horſes; Of armes both o
fenſive and defenſive.

Of offenſive, as Artillerie, muskets, carbin
piſtols, pikes, halberts, partiſans, half-pikes.

Of defenſive, as head-pieces, caſques, gorge
cuiraſſes, pouldrons, vanbraces, corſlets, taces, t
gets, &c. And of draught horſes in abundance
the train of the Artillerie, munitions, and
ctuall.

The proviſion of money is to be made by a g
thering of it together long before hand in the m
abundant meaſure that may be; by the preſervi

[a] *Paces here are to be underſtood ſteps, and not geometricall paces of 5 foot.*

t diligently without imploying of it upon vain unprofitable things; and by distributing of it ere it shall be found necessarie; and in needfull ngs not to be niggardly.

The provision of victuall consisteth in the col- ion and duration of it, the conservation and di- bu ion.

Having made all these preparations, and filled magazines, there must be choice made of some e, there to make the staple of amunition, to the train of Artillerie in equippage, and there ake the muster of the armie, as well of the In- erie and Cavallrie, as of the Artillerie; there to put the armie into form of battaile, even if they were that day to fight with the ene- e.

The manner of ordering the armie for combat, ccording to that which the Generall shall in- d to execute; as to go and conquer a countrey, releeve a place besieged, to give battaile, to rch crosse through an enemies countrey, or to ke a retreat.

If he purpose to conquer a countrey, he ought know the estate of the same, as whether it well peopled or not; whether he might opposed by one or more armies, and what nner of ones; to know their alliances, and the ans how to break them, or at least to hinder m from joyning together, if it be possible; know the passages, their places of entrance issuings out, the woods, mountains, its, ports, keyes, bridges, havens; situation of their cities and places of ngth, their garrisons and munitions. He ght to be informed of the fertilitie of the

coun-

countrey, to cauſe victuall to be carried thither
it be barren, or to diſcharge his armie of that tra
if it abound.

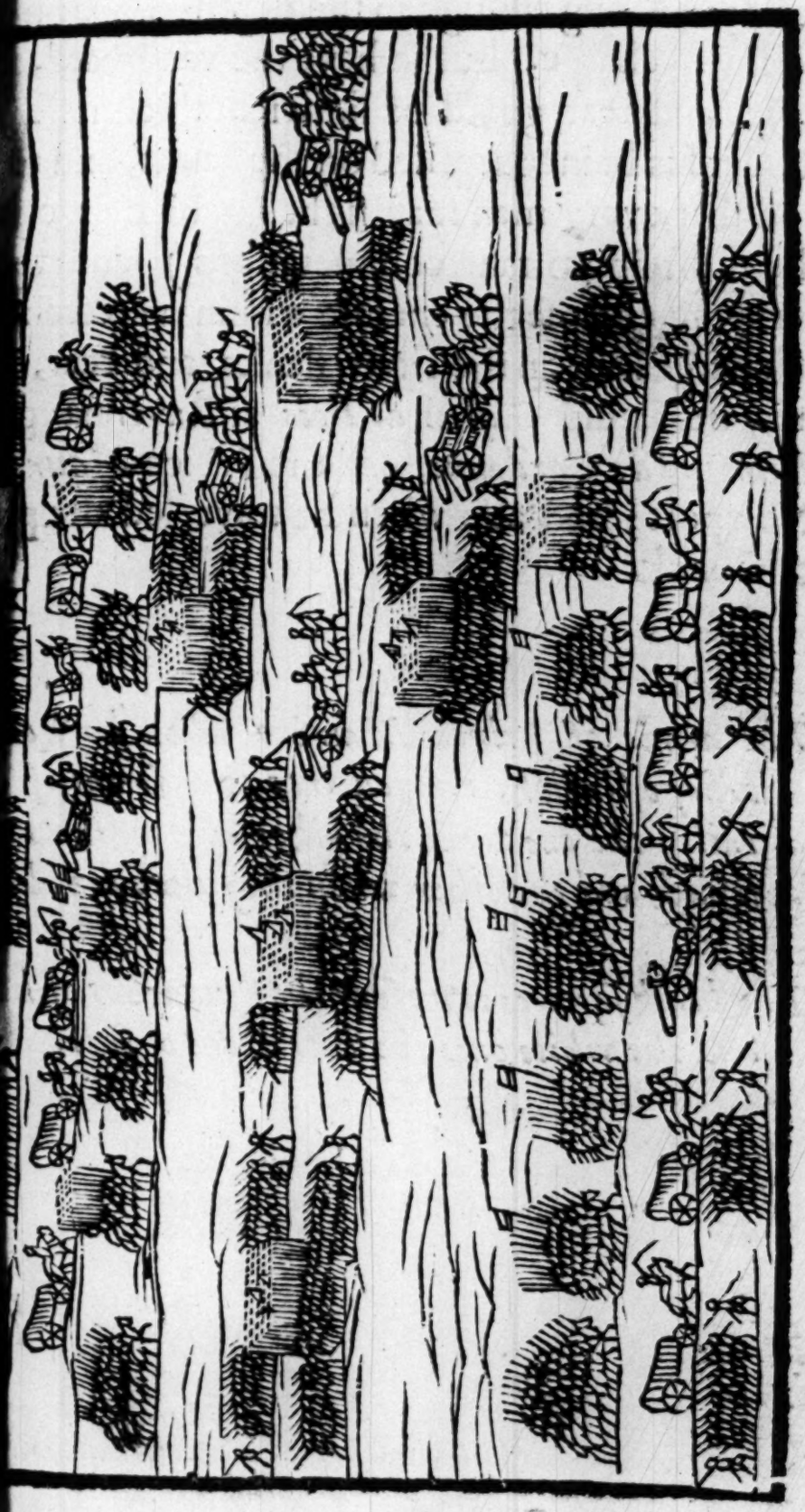
He is to have the plat of the countrey in a gen
rall map, and alſo in many particular ones,
know the ſituation and diſtance of places, a
whether the countrey be plain and even, or t
contrary, and to judge by the capacity of the pla
what front he may give to his armie.

If his deſigne be to releeve ſome beſieg
place, and to convey ſupplies within it, and (
effect that) deſireth to force a quarter, he oug
not to ſpread out the wings of his armie, but
keep himſelf ſerried cloſe, as did Prince *Maur*
when he releeved Coevorden againſt the King
Spains army conducted by *Verdugo*; and t
Marquis *Spinola*, when he went to releeve Gro

T

The armie of the Marquis Spinola when he marched to releeve Groll.

Front.



If he intend to deliver battaile to his enem
(the occasion offering it self, and the countrey b
ing fit for it) he ought to extend the front of
armie as much as may be (yet not so much t
it be not strong enough in the depth to sustain
enemies charge, but to have the van-guard, b
taile, and rear-guard of sufficient thickneſſe
hinder his being surprised on the flanks, and to
end that every man may fight (which is one
the most important considerations) and to
tempt to encloſe the enemie within a crescent,
to charge him on the front, flanks, and rear, i
may be, as did *Gaston de Fois* at Ravenna aga
Raimond de Cardonne, and the Prince *Maurice*
Newport; and also when he traverſed the pl
of Gulick.

*The armie of Prince Maurice when he went
beſiege Gulick, ranged into two forms of b
taile, the one when the pikes and muskets w
joyned, and the other when they were divided*

*The black squares repreſent the squadrons of ho
and the white ones the battaillons of foot.*

F

You may see this figure more largely and more exactly in my book of Cavallry, in figure 16.

If he desire to cause his Army to traverse
march through an enemies countrey, he oug
alwayes to cause them to be quartered togeth
in one body, without disuniting of any part, a
to march in Battalia, making choice of op
places (free from woods) and such as are pla
and even, securing his quarters, and carrying m
nitions with him, requisite for the time of his p
sing through: for it is a very hard matter to le
an armie through an enemies countrey, especia
if it be divided by rivers, covered with woo
and mountainous, and if there be in it places
strength, and a mean armie to defend it self; for
alwayes molests you, cuts off the passage of vict
all, hindreth your armie in their march, alwa
troubleth them on the Flanks or Reare, wai
upon advantag s, seeks occasions of surprisi
and continually layeth ambushes.

But after what manner soever your Army
embattailed, a care you must have that all han
may be brought to fight, and that your Army m
deliver combat at least three times, which it sh
doe if it be divided into Van, Battaile, and Rea
Let the horse be so disposed as they may alway
second the foot, and that in such sort, as findi
themselves disordered, they may finde place
rally themselves under their shelter; having
Battaillon behinde them so near, whereby th
might be again routed after such a disorder. Th
Artillerie ought to be so placed, that it hinder n
the passage of the Battaillons, & that it may eas
discover those of the enemie. For the most p
the Infanterie is within the body of the Armie,
severall Battaillons, disposed checquer wise: th
Cavallrie on their Wings and Reare in severa

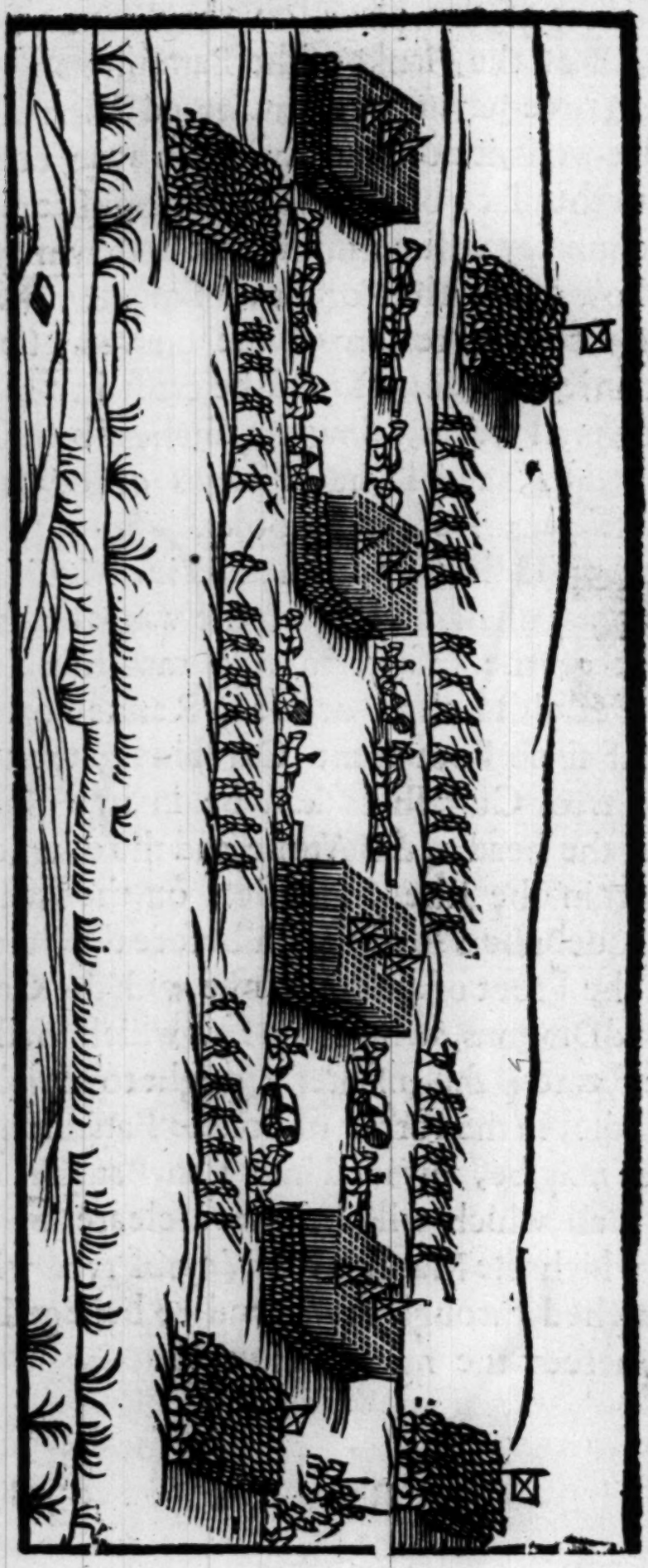
Squadron

uadrons, and the Artillerie according to the nvenience of the place, on the Front of the mie, or on the Flanks of the Battaillons.

The Armie having been muſtered at the place endez-vous, it doth uſually march away in Bat-a, to the place of their encamping that night he countrey will permit it) that ſo they may be ght how to march in order of Battaile; which cannot do by reaſon of the unevenneſſe of countrie, the Pioners muſt be cauſed to make ny ſeverall wayes, filling the ditches, breaking wn hedges, and laying bridges of boats or erwiſe over rivers and brooks.

In the middle-way the Artillerie, Munition, Baggage ſhall march; on the wings of theſe part of the Infanterie is to march in their g order, either three or five in Ranke; on the nk of theſe Foot ſome Carabines; the two d parts of Cuiraſſiers ſhall be in two Squa-ns at the head of the Armie, and the other one d part in the like diſpoſition on the Reare; Harquebuſiers ſhall march before the Cuiraſ-s in the Front of all the Armie with the Cara-es and Dragons, ſaving ſome few which ſhall be the Reare; the Infanterie ought to march in middle, in the forme of double Battaillons as ch as may be, divided into Van, Battaile, and are: all which will be more cleare by the me which the Marquis *Spinola* obſerved when marched through Freeſeland to beſiege Lin-, whereof the figure followeth.

Front.



If the enemie be neare to the place where the rmie is to arive, the Marſhall of the Field (ha-ing choſen a fit place for the field of combat) gives order for the placing of the Artillerie, diſ-parteth the quarters and places of the Regiments nd Munitions, cauſeth all the camp to be en-renched round about according to the art of for-ification. To this end he muſt endeavour to odge at a ſeaſonable houre, that ſo he may have ime to make his retrenchments, to divide the quarters, to place the guards, to ſend out to for-age, to cauſe the huts to be made, to diſcover the actions of the enemie ; and to prevent a thouſand nconveniences which the night produceth ; diſ-poſing all things according to the place and time.

Of encamping the Armie.

Chap. II.

AN Army is quartered in the field or in ſome village : in the field when the enemie is at hand, then muſt it be quartered in Battail-lons, as if every houre there were occaſion of cambat. Alſo, the lodging in the field is when you lay any ſiege, or when the infection compells you to flee the places of ſhelter, or when the countrey is waſted and without houſes.

The quartering in villages is when the enemie is farre off, ſo as you may have time to put the Armie into form of Battaile in the place of A-larm, before he can be upon your jack.

Whether the encamping be in the field or in the villages, it muſt be commodious and aſſured.

It will be commodious if there be abundance of

water, wood, forrage, and capacitie of roome convenient to lodge the whole armie, and to make the Alarme-place.

It will be assured (being in the field) by fortifying the camp round about, by causing it to be well guarded by good Corps-du-guards, and Sentinels within, and Sentinell-perdues without, having Redouts round about, if the enemie be to be feared, or that he be near. *See the Leaguer of Prince Maurice before Sluys, and before Grave,* Fol. 87, 88

It will be assured in the villages when the Alarme-place shall front the enemy, being eminent and commanding the ground round about it, capable to range the whole armie into order of battaile, fortified by art and nature, commodious for the advenues and sallies without confusion of the troops; That it be not assaultable without great disadvantage to the enemie, being near to the quarters, well defended by Artillerie, and well secured by Corps-du-guards, aswell of Infanterie as Cavallrie.

Concerning the quarters, they must be difficult to force and to assault (at lest unawares) facile to be relieved, and therefore near together, fortified, retrenched, and well guarded.

So then, all that is to be considered about the lodging of an Armie which is to be encamped for a long time (for, for one night it is onely requisite to make choice of places advantagious and such as are strong by nature, or to defend them by waggons or other meanes of enclosing the camp) consisteth in the commoditie of six things, namely, victuall, water, forrage, wood, situation, and enclosures of the field.

Having

Having regard to the certaintie of victuall and unitions by not adventuring too farre of; and aving none of the enemies towns on the Flanks hich might intercept or cut off your way; eking out the commoditie of rivers, to be ſer-d of water to drink, for conveyance, or to im-le with waggons, and to ſecure the one Flank the Armie; it being impoſſible to be with-t them, and chiefly good ones.

For theſe reaſons mountainous places are to avoided, and alſo valleys; the one for the rrenneſſe, the other for the badneſſe and diſ-mmoditie of the filthy pooles, and for the bad e which they cauſe, being crude and foggie.

Regard muſt be had of the abundance, com-oditie, and certaintie of forrage; for the horſe ake an incredible waſte, beſides that much is quired for the Souldiers to lie upon and to ver their huts with.

Good ſtore of wood muſt be had for fires in e Corps-du-guards, and to build huts.

A care muſt be had that the place where you tend to encamp be ſmooth, plain, and ſandy (if may be) farre from any place that commandeth , or if there be any, it muſt be ſeaſed upon and ken in within the retrenchment, to diſcover and ommand the champain.

If there be any wood near, you ought to make e of it and guard it, ſomewhat enlarging the trenchment, and leaving roome between both, meet with ambuſhes which the enemie might y within it.

The forme of a retrenchment of an Armie is ſually ſquare, and the ſides thereof ought to be rtified by Tenailles, to defend the one by the

other, and ſo to be diſpoſed of, as in giving fir
by night thoſe of the Armie may not hurt eac
other; making them more or leſſe ſtrong, as th
enemie is more or leſſe to be feared.

Touching the particular things which con
cern the diſparting of the lodgings within the en
cloſure of the camp, theſe things are to be obſer
ved;

The retrenchement ought to be in breadth an
depth two fadomes, and the parapet one fadom
in height. Round about the inſide of the re
trenchement there muſt be a ſpace left of [a]40 o
45 fadomes broad, which is called the Alarm
place, which muſt be ſpacious enough to con
tain the whole Armie in Battalia.

[a] *The proportion generally obſerved is 200 foot.*

Then follow the quarters of 300 foot [b] deep
which muſt be divided (for the making of th
lodgings) after this manner;

[b] *The Authour ſaith 300 foot broad, but that is a miſtake.*

For a Companie of 200 footmen there mu
be 56 foot in Front, and 200 in depth, to make
rowes of huts, 25 in each row: between whic
there muſt be 3 ſtreets of 8 foot broad. Ever
hut hath 8 foot ſquare to lodge 2 ſouldiers. A
the doores of them open upon 2 ſtreets, and an
ſwer juſt over againſt each other.

The quartering of a Foot-companie.

.B. *The Front of a Companie, is of foure huts.*
.C. *The depth, is of 25 huts.*
. *The ſtreets between the huts.*

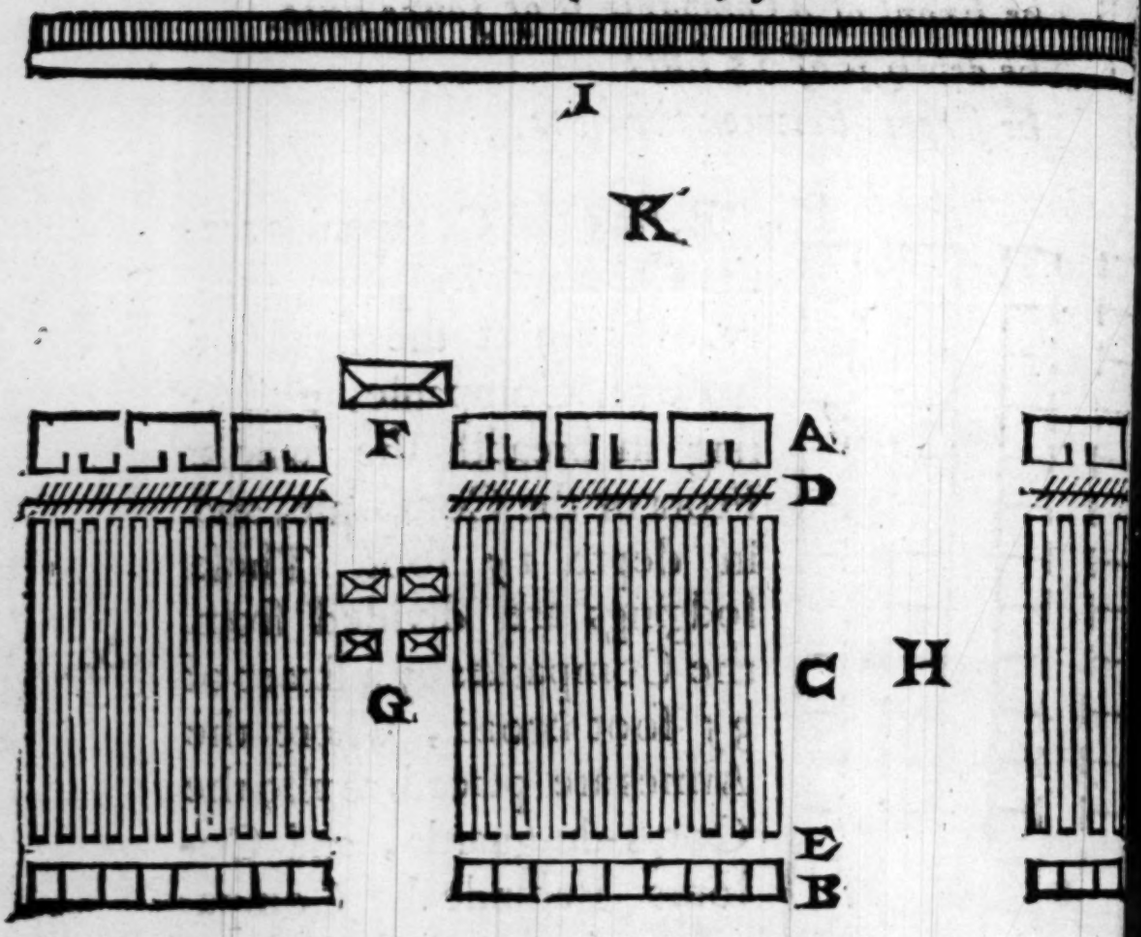


Before the Companies are the Captaines lodgings, every of them at the head of his own Companie, poſſeſſing in breadth the whole Front of the Companie, and in depth 25 foot. Theſe lodgings are divided from the Companies by a ſtreet of 35 foot broad, where the Armes are placed, as alſo the Corps-du-guards, and Colours. Behinde the Companies are the Sutlers huts, containing 20 foot in depth, and theſe are ſeparated from the Companies by a ſtreet of 20 foot broad. The Companies are divided from each other by a ſtreet of 8 foot breadth.

In the middle of the Regiment, there muſt be a place of 80 foot breadth, in Front of which the Colonell is to be lodged, and more inward, the Sergeant Major, Provoſt, and all the Officers of the Regiment. The ſpace between each Regiment muſt be 200 or 300 foot.

The

The quartering of a Regiment of six Companies of foot.



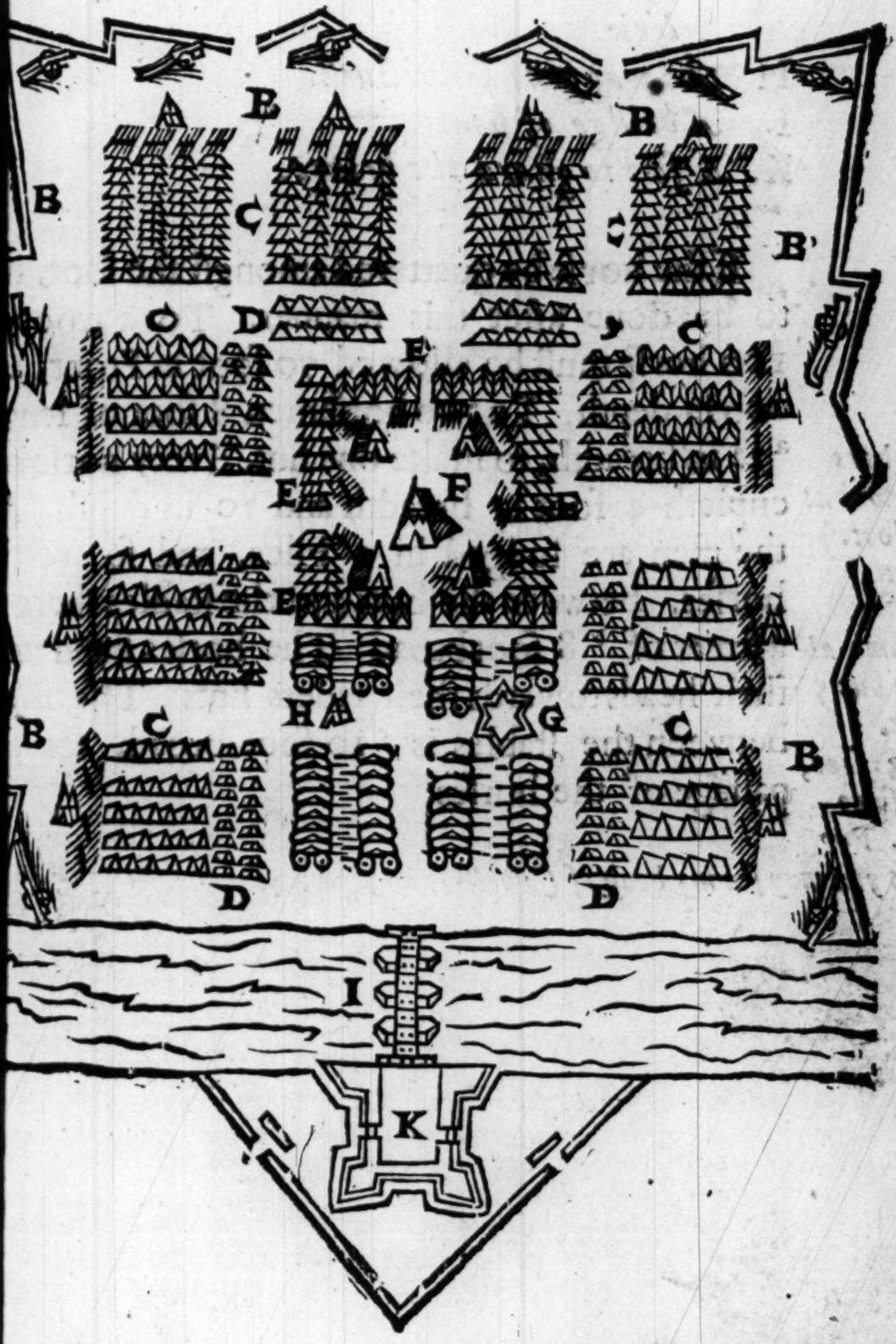
The placing of the Captaines tents at the head of their Companies, is now left off. And they are now in the Reare of them in E. *and before the Sutlers: partly for that by this means the Captains can better take notice of, and so remedy the disorders which happen in the Sutlers huts: and that so the accesse to the Alarme-place may be the freer, for that the Captaines tents (taking up the ground before) hindred it.*

I. *The retrenchment of the camp.*
K. *The Alarme-place.*
A.B. *The depth of the quarter.*
A. *The Captains lodgings.*
D. *A street between them and their Companies where the Pikes are placed.*
C. *The Companies.*
B. *The Suttlers.*
E. *The street between the Companies and Sutlers.*
G. *A void place in the middle of the Regiment.*
F. *The Colonels lodging.*
H. *A space between the Regiments.*

When

When the Infanterie is quartered alone with-
t Cavallrie, it is diſpoſed as the figure following
eweth.

The Infanterie quartered on the ſide of a river.



A. *The*

A. *The field of battaile.*
B. *The Alarme-place.*
C. *The huts of the quarters.*
D. *The Sutlers.*
E. *The guards of the Generall.*
F. *The Generals lodgings.*
G. *The quarter for the powder and train of Artillerie.*
H. *The waggons for victuall.*
I. *A bridge of boats.*
K. *A fort to guard the bridge.*

If the horſe be quartered amongſt the foot, it is to be done after this manner. To a troop of 100 horſe muſt be allowed 70 foot in Front, and 200 in depth. To two horſemen 8 foot of length, [a] 12 in breadth, to make one hut. Every horſe occupieth 4 foot in breadth and 10 in depth. And the men are lodged in 2 Files, and ſo are the horſes. Between the huts and the ſtables there is a ſtreet of [b] 8 foot broad. The horſes ſtand with their heads towards their riders huts The ſtreet between the ſtables is [c] 10 foot broad, for the paſſage of the horſes.

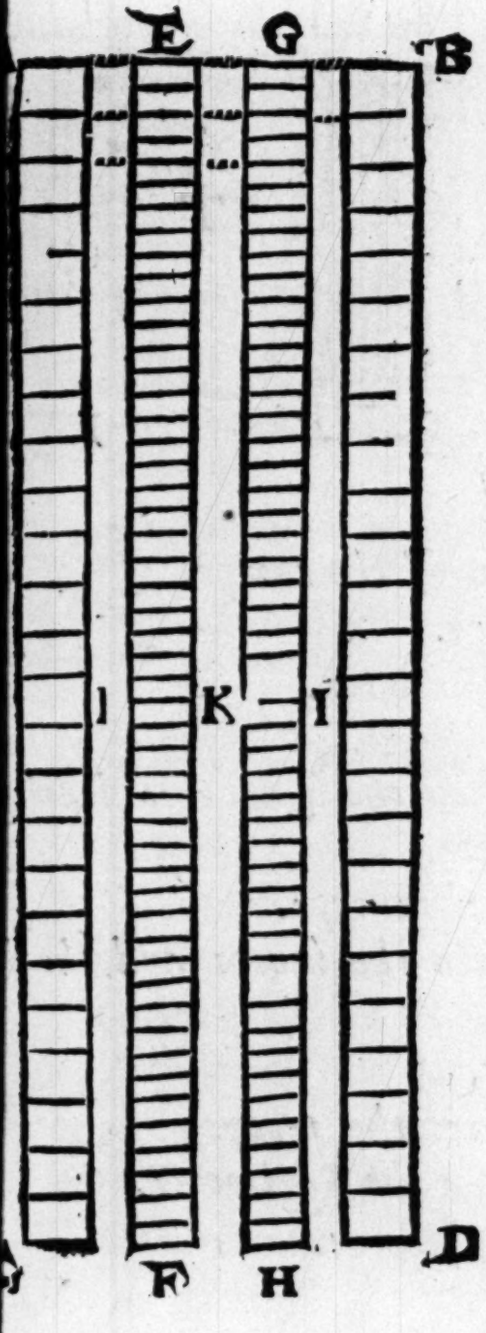
[a] *Others allow but 10 foot.*

[b] *Some allow but 5 foot.*

[c] *13 foot, as ſome ſay. For this you may ſee my book of Cavallrie in figure 4.*

The quartering of a troop of 100 horse.

B. The Front of the troop.
C. The depth.
C. and B.D. The ſouldiers huts, 25 in each file.
. and G.H. The 2 rowes of ſtables, each of them for 50 horſes.
Is the ſtreet between the ſtables.
Are the ſtreets between the huts and the ſtables.

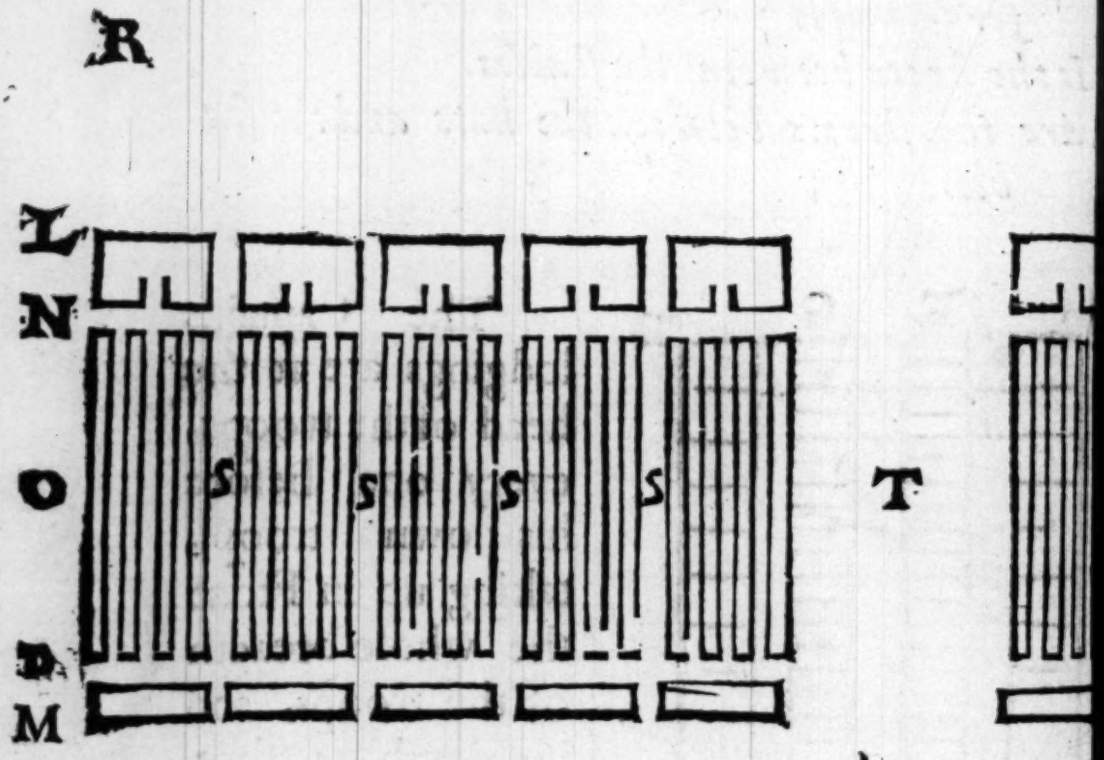


The Captains lodgings are at the head of the troops, every one before his own troop, taking up in Front the whole breadth of the troops, and in depth 40 foot. Betweene theſe lodgings and the troops there is a ſtreet of 20 foot breadth. Behinde the troops are the Sutlers huts, of 20 foot deep, ſeparated from the troops, by a ſtreet of 20 foot broad.

The diſtance betweene each troop is 20 foot.

The

The quartering of a Regiment of five troops of horſe.



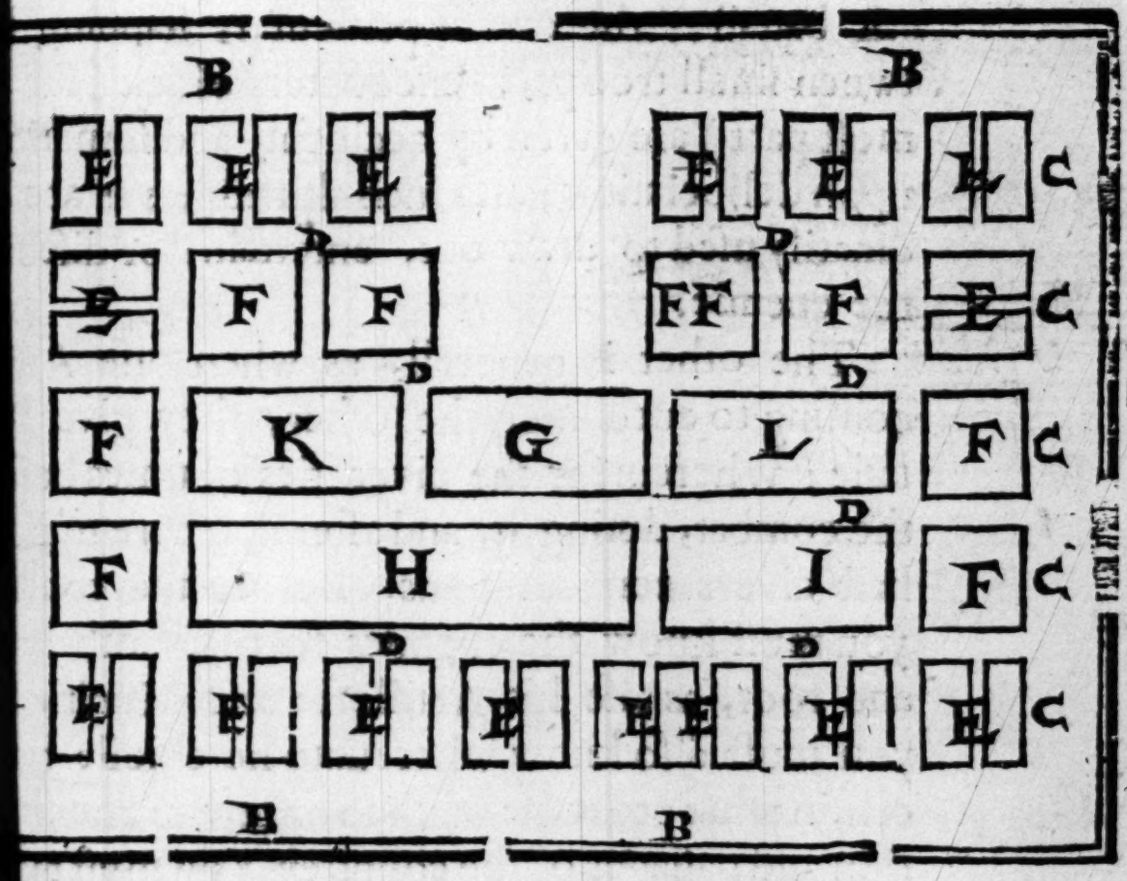
Q. *The retrenchment of the campe.*
R. *The Alarme-place.*
L.M. *The depth of the quarter.*
L. *The Captains lodgings.*
N. *The ſtreet between the Captains lodging and their troops.*
O. *The lodgings of the trocps.*
P. *The ſtreet between the troops and the Sutlers.*
M. *The Sutlers huts.*
S. *The ſtreets between the troops.*
T. *The ſpace between the Regiments.*

Who

When the horſe and foot encamp together.
ey are diſpoſed of as the figure following de-
onſtrateth.

It ſeldome happeneth that they are quartered
gether, by reaſon of the great annoyance which
Cavallrie bringeth to the Infanterie.

A quarter of Infanterie and Cavallrie, fronting every way.



The Alarme-place.
The quarters.
The ſtreets between the quarters.
The Regiments of foot.
The Regiments of horſe.
F. *The Generall of horſe.*
The Generall of the Armie.
The quarter for the Artillery, and the Generall thereof.

I. *The*

I. *The quarter for the Commissarie Generall the victuall, and his train.*
K. *Lodgings for Strangers.*
L. *The Market and Shambles.*

Of embattailing the Armie.

Chap. III.

There be two kindes of occasions of givi battaile; the one is particular, hapning b tween small troops, as encounters which (for t most part) are given by accident, and sometim upon deliberation; also such skirmishes as are dinarily used to draw out, entertain, or disco the enemie.

The other is generall, as when one Arm coming to encounter the other, they give B taile; wherein for the diversities of times befo the combat, during it, and after it, there must had divers considerations. Before the comb you must know the enemies forces, both ho and foot, as also his Artillerie and Munition you must also know whereunto he chiefly tru eth, in what order he useth to fight, also the sit tion and passages of the countrey. You must ma diligent discoverie of his designes and actions your own spies, or the enemies, being corrupt with money or promises.

You must attempt to divide his forces, to ra jealousies and diffidences between his chiefs, between them and their officers, to incite his sol diers to mutinie.

You must strive to seize upon the most adva tageous ground to range the Armie into Battali

havi

ving regard to the winde to avoid the duſt and oak, and to drive it into their eyes; and to the ne, that you be not dazled: directing your f according to the place, and the number of ur own and the enemies forces.

The ſouldiers muſt be deprived of all hope ſaving themſelves by flight, and muſt be ought to a diſpoſition to fight courageouſly; pounding to them the glorie, the bootie, the ompenſe, and the neceſſitie.

The order which muſt be obſerved in ranging Armie for [a] combat hath been ſhewed in the t chapter, being the ſame as the march in bata.

The Artillerie muſt play ſo ſoon as they be- to diſcover the battaillons of the enemie, king the batterie fitly and ſpeedily, to diſorder ſcatter them before they come to give bate.

Whileſt the Armie ſtands ranged in battalia, ex- ting the ſignall for combat, the Marſhalls of field ought to ride before the Van, to cauſe m to advance when the fight ſhall begin, acding to the Generalls order, and to command battaillons to joyne and charge the enemie, to receive his charge according to occurces.

The Generall of the Armie by his dilince ought to be as the ſoul in the body oughout all the members; alwayes obſerg the countenance of the enemie, to make men fight to purpoſe; aſſiſting the broken taillons by freſh ones, or by ſquadrons, ordering thoſe which (having been diſnded) ſhall rally again, to ſend them to

[a] *In my book of Cavallrie (before mentioned) you may ſee divers formes of battaile in figure 8,9,10, &c.*

the combat to releeve their fellows. And because such as have been beaten will hardly return to fight again, you must not trust too much to them.

As soon as you be within reach of the Canon, you must go on directly upon the enemie, (unlesse you be sheltered from his Artillerie) by this means your souldiers are encouraged, you avoid the danger of the enemies Canon, and you leave behinde you the place where your Armie stood ranged, which ground will serve to rally and order the Battaillons which shall happen to be routed. You must not give on so hastily, as that thereby the Battaillons be disordered; and on the other-side you are to use a marching pace until you come within distance of a Pistoll-shot, but then to double your pace and to charge furiously, the Pikes being close serried, and the Muskets continually playing on the Flanks, having certain Targetteers in Front which may shelter the Battaillon, and disorder the enemies Pikes.

You must give a sufficient Front to the Battaillons, that so they may overwing the enemie, and charge him in Front and Flank, observing on which part the enemie giveth the most violent assault, and thither to send the troops of Reserve as also, where he is weakest, that there he may be the more easily routed; dissembling and concealing all sinister accidents; and whatsoever proves prosperous, to cause that to be published aloud, for the raising of their spirits which happily might be become heartlesse, either by over much labour, or by the rumour of some disaster propounding to them the faintnesse of the enemie, the death of his Commanders, the flight

is troops, the ſpoil, the honour of the victorie, nd the great bootie; Sending the orders and ommands by Officers and perſons known, and ot from hand to hand by *paſſe parolle*.

After the combat, either you are vanquiſher r vanquiſhed: If you be vanquiſher, and have o cauſe to feare the enemie any more, as being ot able to rally himſelf, either you content your lf with the victorie, or you attempt farther to onquer.

If you reſt content with this victorie, God is olemnly to be praiſed, the ſouldiers are to be re-uced, commended, and recompenced, principal- the Chiefs and ſuch as have performed any gnall acts, ſharing out the ſpoil amongſt them ccording to their merits, giving order that the riſoners be truſtily kept and courteouſly uſed, auſing the hurt to be carefully cured and the ead buried.

If you attempt to conquer the enemies coun-ey, you are to publiſh the victorie, for that will auſe his confederates to ſhrink from their al-iance, it will affright your enemie, and will make he Neuters to declare themſelves for the victour; will keep your confederates faithfull and con-ant, your ſubjects obedient, and will procure fa-our from all men. Then the Armie muſt be ſup-lied with men and munitions, the enemies gar-iſons muſt be ſummoned, recompenſing ſuch as hall yeeld the places within their cuſtody, deal-ng rigorouſly with ſuch as ſhall be headſtrong, aining the great ones of the countrey by money, eſtates, and honour, attempting to ſeize upon the dvenues and paſſages, and to leave nothing at our back which might hinder the paſſage of

your munitions and victuall. If you be vanquiſhed, either the enemie gives you time to retreat, or elſe he purſues you with all his forces. If he give you time, you muſt gather together all what poſſibly you can of your broken and ſcattered men, making your retreat reſolutely and honourably, and ſhewing your ſelf in the field again ſo ſoon as may be with the greateſt number of ſouldiers that can be gotten, to make head again againſt the enemie, to oppoſe his deſignes, to diſquiet and moleſt his actions, to work his confederates to oppoſe him, to divert and divide his forces, to fortifie the paſſages, to provide and furniſh your frontier places with victuall, munition, and garriſons.

If you be purſued with extremitie, you muſt retreat in the beſt order you ſhall be able, making it appear you are not vanquiſhed in your courage, though you be ſo in your fortunes; cauſing all your countrey to take armes, and that ſuch as ſhall be in armes do preſent themſelves at the paſſage to hinder the enemies entrance, breaking down the bridges and landing-places of rivers, cutting of the high-wayes, and felling of trees to lay a croſſe the high-wayes, breaking down the ſluces, and drowning the countrey, if it be poſſible, aſſuring your ſelf of the fidelitie of your cities and ſubjects, the one by forts, cittadels and garriſons; the other by hoſtages, offices and benefits.

Of the building of forts.

Chap. IIII.

Before the fortifying of any place, consideration must be had of the situation: for if it be on a mountain which is all a rock, and that the place comprehendeth all the top, it will be difficult to approach, the flanks will be secured, it will be free from mines and command, it will easily discover round about, it will do horrible execution, and will be wholesome both for the inhabitants and for the munitions. But such a place hath usually these discommodities, want of water and earth, hard to be retrenched, easie to be quickly blocked up, and the passages and advenues for the releeving of it, easie to be cut off.

If it be on a mountain which is not a rock, it will be subject to mining, the trenches of approach will be easily undermined, and it will have almost all the discommodities of the place above said; but it will also have the advantage of store of earth, and by that means it may easily be retrenched.

If the place be seated on a mountain which hath one or more advenues which command it, such place will be easie to be assailed and battered from those advenues.

If the place be mooriſh, the approaches are difficult, but the discommodities are great for them within it; for they are soon shut up, their sallies are difficult and dangerous, the place is unwholesome for the inhabitants, the

munitions are ſoon corrupted, and it is hard to b releeved.

If the place be on a plain, but commanded b one or more hills, it will have an infinite numbe of diſcommodities, and almoſt no conveniences.

If it be in a plain which is ſandy, the work which there ſhall be made will hardly be wort any thing.

But if it be on a plain champain, and levell o all ſides, the earth being fat and ſtrong, it will b eaſie there to fortifie, and to prevent the diſcom modities, having very advantageous conveni ences.

But whatſoever the ſituation be, if you inten there to fortifie, you muſt firſt calculate whethe your means be ſufficient, whether the ſeaſon b firting, whether you have a ſufficient number o workmen and tooles, time enough to finiſh it be fore the ſeaſon change, or the enemie can com upon you; whether you have ſouldiers enoug to guard it, ſufficient Artillerie to defend it, mu nition enough for the ſouldiers and Artillerie, v ctuall ſufficient for the men, and fodder for th horſes, ſuccours ſo near as that they may arriv within ſuch time as it may be conceived the for may be maintained againſt the violence of th enemie.

If all theſe things do favour you, you ma boldly fall to work, having regard firſt to th matter, and ſecondly to the forme.

Concerning the matter, if you have the com moditie of ſtone, brick, and chaulk, you muſt lin all the works of the curtains, bullworks, an counterſcarps with good and ſtrong ſloapings, af ter this manner; thoſe of the curtain and coun

terſcarp

rſcarp have a fourth part of the height for
eir ſloap, and thoſe of the faces of the Bullworks
third.

The faces of the Bullworks muſt have ſpurres,
n foot diſtant from each other, of three foot
ick and 25 foot long, the ſaid ſpurres being
ongly bound in with the wall, which muſt be
ilt in arches underpropped 6 foot without the
undations onely on the ſpurres.

If you have onely earth, there muſt be ſuch a
oap given to the works, according as they are
ong or ſandy, ordinarily of 5 foot one. Such
orks muſt be well furniſhed with palliſadoes,
d environed with water, for they are ſubject to
rpriſes, becauſe the ſhowers of rain and froſts
ake them moulder away.

Touching the forme, if it be regular (which is
hen it hath the ſides equall) ſuch as the forti-
cation of one face is, ſuch are all the reſt. But
it be irregular (which is when the ſides be un-
quall, as all cities are which are repaired) the
rtification on all parts muſt be diſagreeing. But
hat forme ſoever it hath you muſt obſerve the
les following as much as may be, and labour to
ake it equally ſtrong on all ſides.

Rules of Fortification.

That the angles or points of the Bullworks
which are called angles flanked) be made as great
nd blunt as may be; for the more obtuſe the
anked angles be, the better; and the angles flank-
ng are the more ſharp.

. B. C. *The angle flanked,*
. C. D. *The angle flanking.*

That the ſhoulders of the Bullworks be made

massie enough to resist the violence of the ene
mie, and to hinder him from ruining the flank
which they cover; and long enough to cove
(in sight) at least half of the flank of the casemat
when you behold it from the point of the coun
terscarp of the opposite Bullwork. The casema
must have of breadth the moytie of the thickness
of the shoulder, and the plain of it of 2 foot high
above the plain of the drie moat, or of the sur
face of the water. The line of the thickness
of the shoulder, and of the breadth of the case
mat, is called the line of the flank, and the longe
it is, the better: provided that it bring no discom
moditie to the other parts.

F. G. *The thickneſſe of the ſhoulder.*
F. E *The breadth of the caſemat.*
E G *The line of the flank.*

That every face of a fortresse must have two
flanks, that so it may defend it self both on the
front and on the sides, and the one by the other.

O. *Is the center of the Bullwork,*
O.P. *A face of the fort.*
H. *Is one flank.*
I. *Is the other flank.*

That the lines of defence be not so long, that
they be without the reach of your shot; nor so
short that the enemie (being lodged on the
counterscarp) be able with his musket shot to
beat yours out of your casemats.

I. B. *and* H. D. *are the lines of defence.*

That the Bullworks be large and hollow, capa-
ble of divers retrenchements, that there may be
formed large flanks, and that they may contain
good store of souldiers: for the hollow room is

the

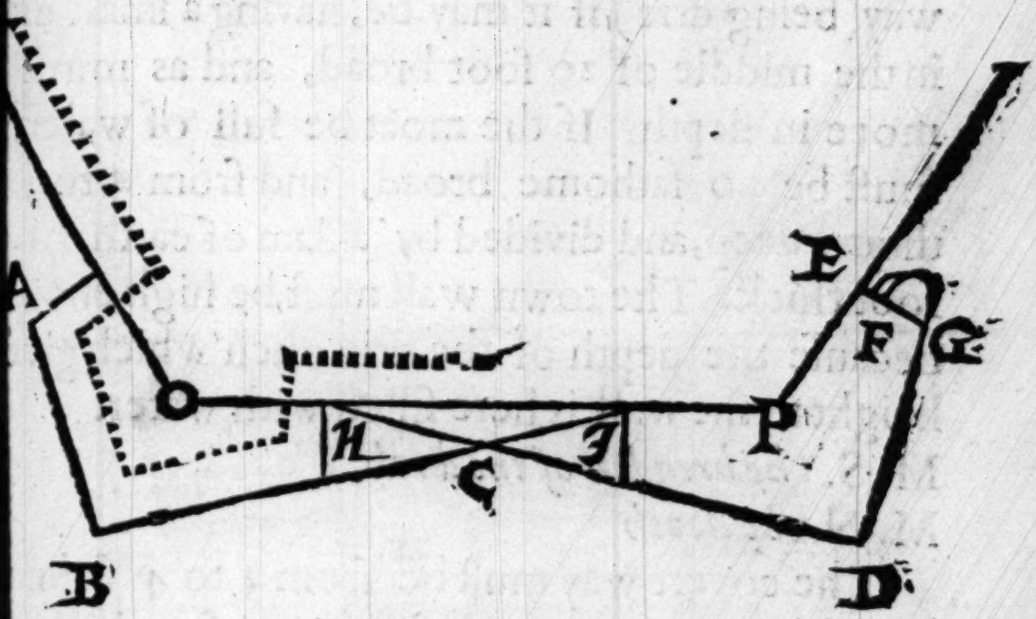
e place appointed to fight in, and to bear re-
enchements.

. *and* P. *repreſent the places of the Bullworks.*

The ſallie-ports ought to be placed between
e ſhoulders of the Bullworks, and the caſe-
ats.

The ſally-port.

. B. H.B. I.D. *and* D.G. *the faces of the Bull-
works.*



That the faces of the Bullworks and the cur-
ns be ſunk within the moat to the upper line,
d that upon this line there be a parapet of 8
ot height and [a] 3 foot thickneſſe. Then let the
ay for the rounds be 2 fathom broad (therein
ing comprehended the 2 foot-banks of the pa-
pet) aſwell of the Bullworks as the curtains.

The upper line or ſuperficies.
The parapet of the curtain.
The way for the rounds.
The foot-banks.

[a] *Three foot for the thickneſſe of the parapet is (ſurely) farre too little. Maroloys and others* 20 *foot. And the Authour himſelf ſayes from* 15 *to* 20 *foot, in the rds following.*

That

That the rampart of the Bullworks be 15 foo
high on the plain of the citie, and that of the cu
tain twenty five, without reckoning the parape
briefly that it be so high, as it may keep the hous
from being battered and ruined. Let their parape
be from 15 to 20 foot thick, and 8 foot high.
Y. Z. *The height of the rampart of the Bullwork*
Z. θ. *The thicknesse of the parapet.*

The ditches must be from 12 to 16 fathom
broad, and from 5 to 6 deep, beneath the cove
way (being drie) if it may be, having a small dit
in the middle of 20 foot broad, and as much
more in depth. If the moat be full of water,
must be 20 fathome broad, and from 4 to 5 f
thome deep, and divided by a dam of earth of
foot thick. The town wall must be high enoug
because the depth of the drie ditch which give
height to the wall, is here filled with water.
M. S. *The breadth of the ditch.*
M. N. *The depth.*

The covert way must be from 3 to 4 fathom
broad, having a parapet of 10 or 12 foot high, t
moytie of it being sunk into the plain.
L. M. *The breadth of the covert way.*
K. L *The height of the parapet of the counterscar*

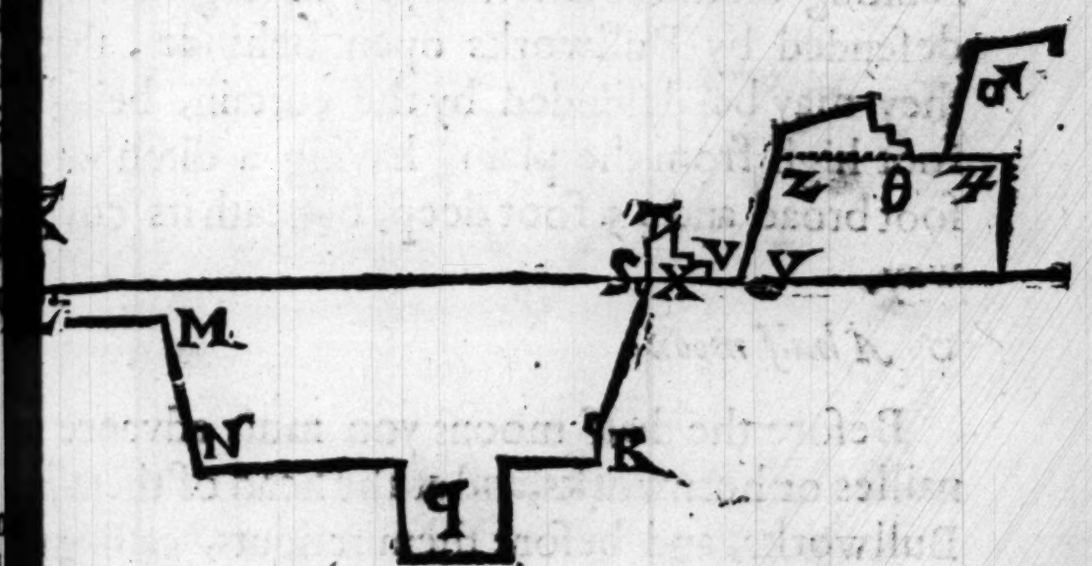
The parapets must be of earth, or of unbur
brick, except the outward row, which must b
of burnt brick, to resist the injurie of weather.

If the curtains be long, there must be a cava
lero set on every point; but if they be short the
will need but one, which shall be on the midd
of them. They must be so high as they may com
mand all the works, and the hillocks without,
there be any, and if it may be. They are commo
ly raised 10 foot above the rampart. Their leng

taken from the number and qualitie of the Ar-
llerie which you would plant thereon ; and
eir breadth dependeth on the length and rever-
ng of the pieces of Artillerie and of a parapet of
ree fathomes and a half thick.

. 8 The height of the cavallero upon the rampart.

The pieces of ordinance nearer to the center
the fort muſt command thoſe which are far-
er off ; raiſing the one above the other from 8
10 foot.



That all the walls of the Bullworks and cur-
ns turn their Front from the oppoſite places
hich command them, leading them bias-wiſe,
at ſo the batterie be not raiſed perpendicularly
on it, and that the bullet may glance by means
the bias and ſloap, and that they be not com-
anded nor ſeen from farre off.

The market place of the citie (or ſuch places
here the grand watches are kept) muſt be co-
red in the middle, to ſhelter the battaillons from
e rain, and there muſt be pent-houſes along the
eets, which lead to the rampart, to the ſame
d.

The

The ſtreets ought to be 6 fathom broad at t
leaſt, that ſo the waggons and Artillerie may pa
the freelier.

The ſtairs to paſſe to the covert way of t
counterſcarp, muſt be juſt in the middle of t
curtain, between the two flanks of the Bu
works.

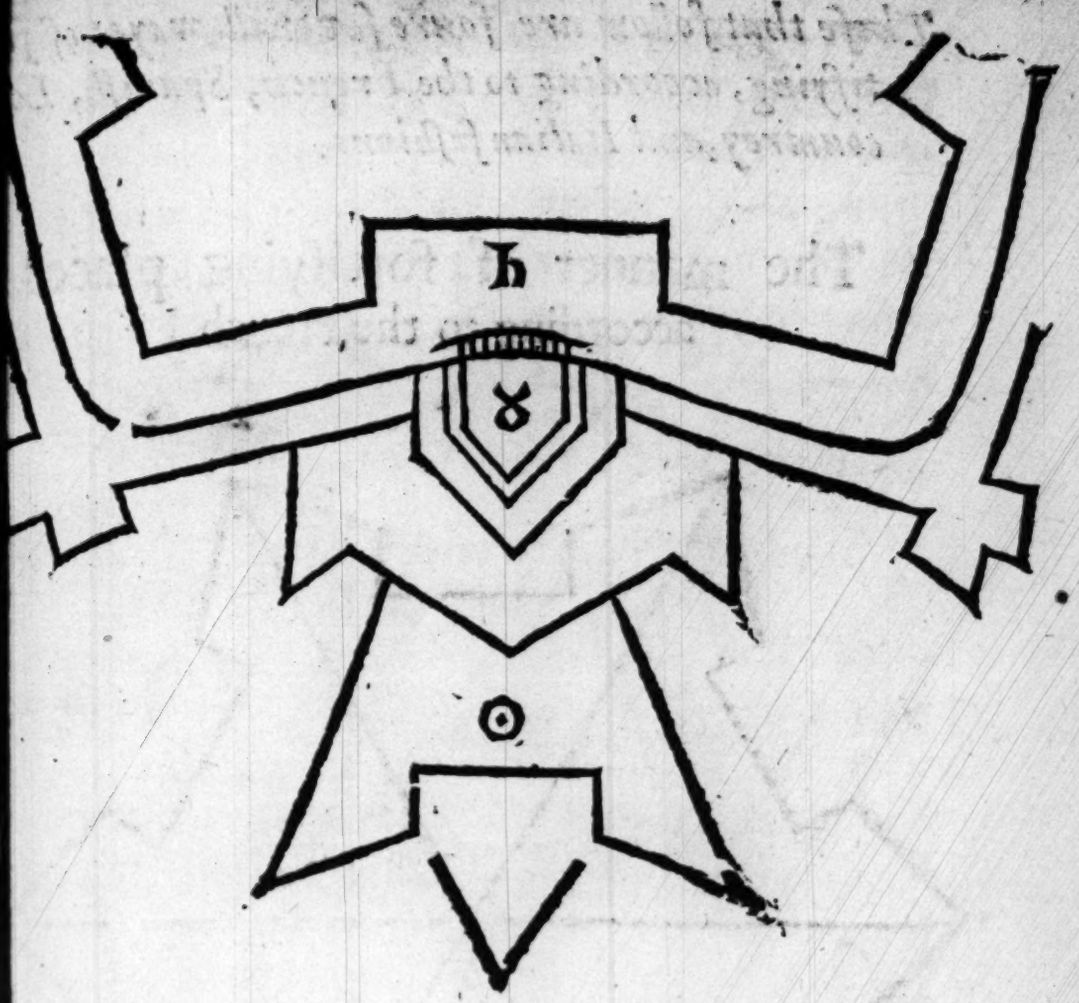
h *Stairs of the counterſcarp.*

There muſt be half moons made on the fo
part of the curtains, right over againſt the angl
flanking on the counterſcarps; having their fa
defended by Bullworks open behinde, tha
they may be defended by the curtain, being
foot high from the plain; having a ditch of
foot broad and 15 foot deep, beneath its cove
way.

g *A half moon.*

Before the half moons you muſt advance
nailles or hornworks, and at the head of them h
Bullworks, and before them redouts, caſting
earth on that ſide towards the citie, which
ſerve for a parapet. Theſe works muſt be 10 f
deep and 15 foot broad, and muſt be defen
from the citie and from the counterſcarp.

⊙ *Trenches, half bullworks or counterpoints.*

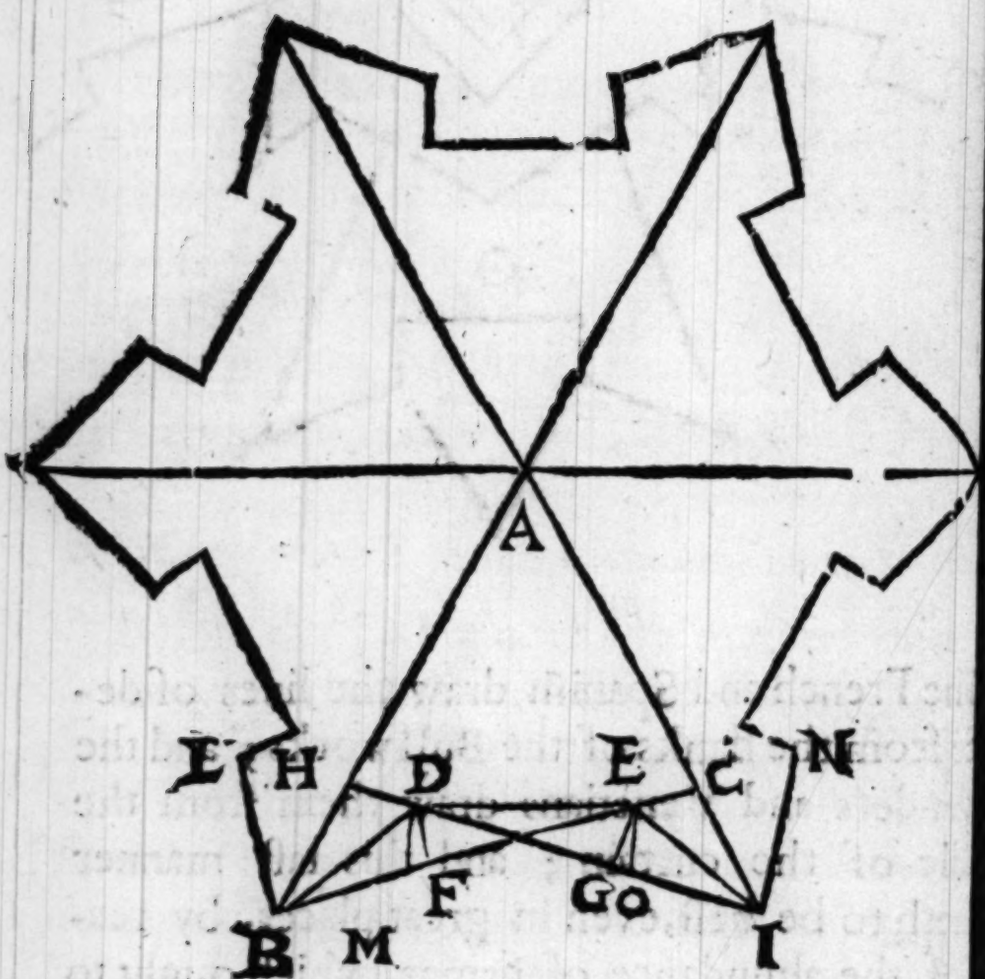


The French and Spaniſh draw the lines of de-
ce from the flanks of the Bullworks; and the
landers and Venetians draw them from the
dle of the curtain; and this laſt manner
neth to be beſt, even in great places, by rea-
of the abundance of firings, which ought to
referred before the form of flanked angles.
The inconvenience of ſuch places as overtop
command you, may be remedied, either by
ing them down, ſheltring your ſelf from them,
poſſeſſing and fortifying them by a hornwork
enaile, or by two half Bullworks, or by one
lwork and two half ones, thereafter as they
n greatneſſe: at leaſt you muſt be ſheltred from
m by good and ſtrong traverſes.

Theſe

These that follow are foure severall wayes of fo-
tifying, according to the French, Spanish, Low-
countrey, and Italian fashions.

The manner of fortifying places according to the French.



A. B. C. *and* A. I. H. *Are each of them 2*
right angles, that so you may have L. B. F.
G. I. N. *right.*

B. D. *and* I. E. *divide the half-right angles*
two equall parts.

D.

F. *is perpendicular upon* B. C.

G. *is perpendicular upon* I. H.

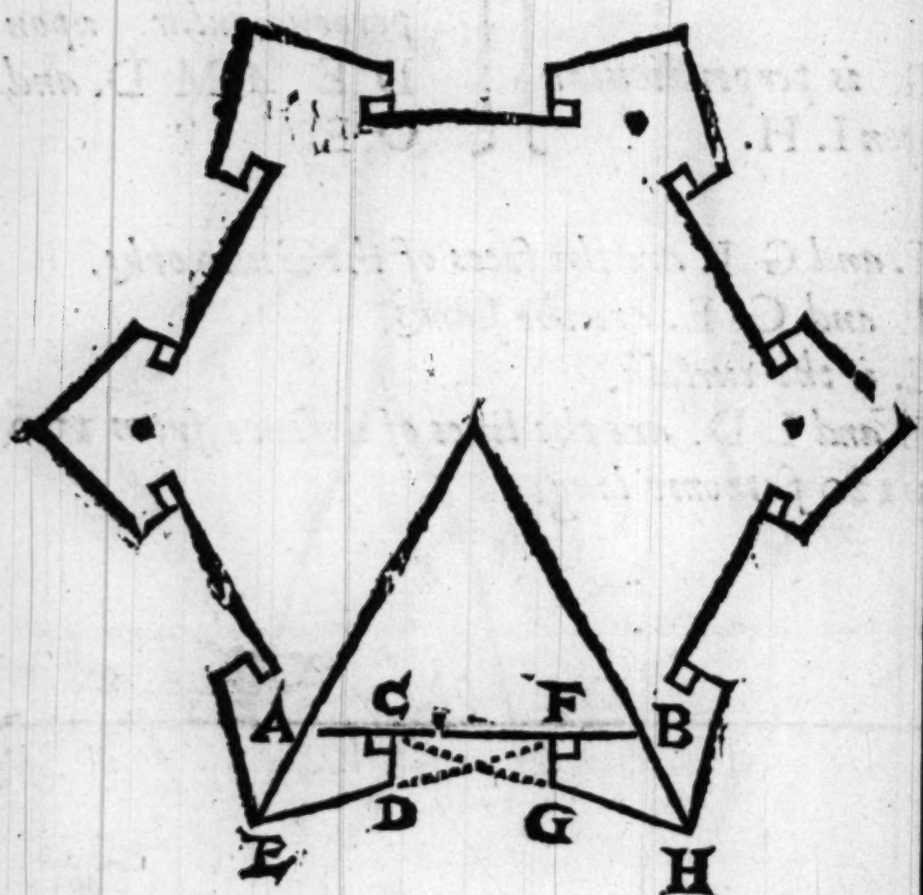
In the figures which have lesse then nine sides: but in those figures which have above eight, they are perpendicular upon D. E. *As* M. D. *and* O. E.

F. *and* G I. *are the faces of the Bullworks.*
F. *and* G. E. *are the flanks.*
E. *is the curtain.*
E. *and* I. D. *are the lines of defence, from* 100 *to* 120 *fathome long.*

The

The Spaniſh fortifications.

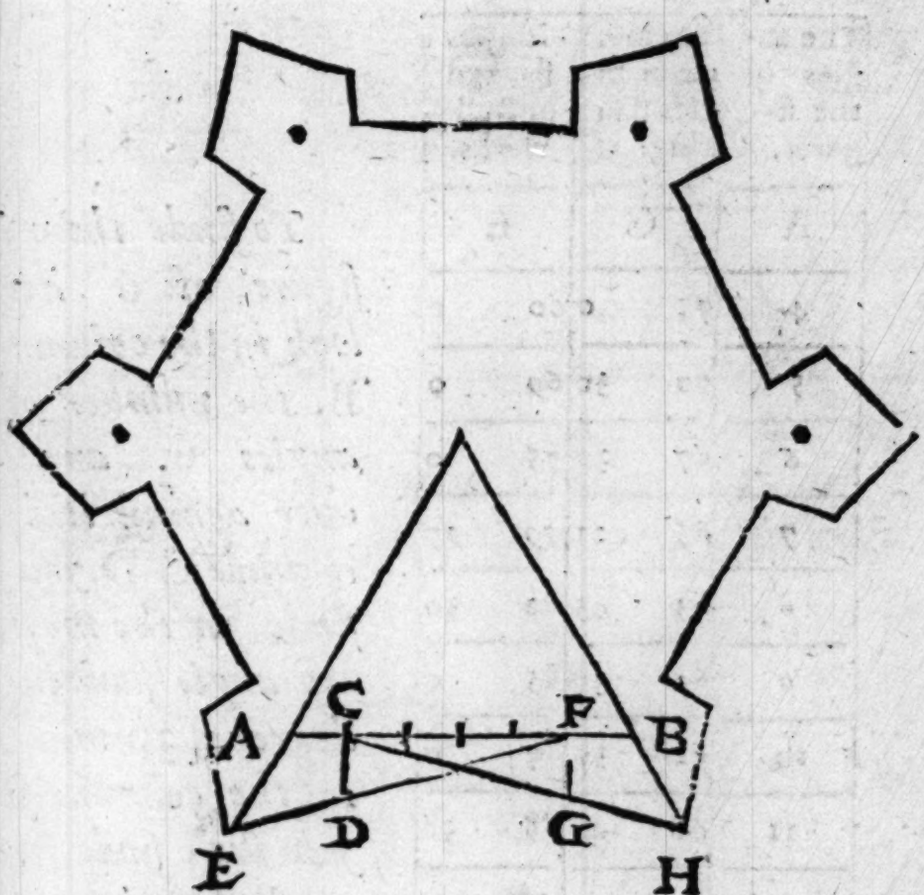
When the Bullworks are made with eares or orillons.



A. B. *Muſt be divided into* 8 *equall parts.*
A. C. *and* B. F. *have each of them two.*
C. D. *and* F. G. *have each of them one.*
E. F. *and* H. C. *muſt be from* 850 *to* 900 *foot long.*

The Spaniſh fortification.

When the Bullworks are made without orillons.



B. *is divided into 6 equall parts.*
C. *and* B. F. *have each of them one.*
D. *and* F. G. *have alſo each one.*
F. *and* H. C. *muſt be from* 850 to 900 *foot long.*

Low-Countrey fortification.

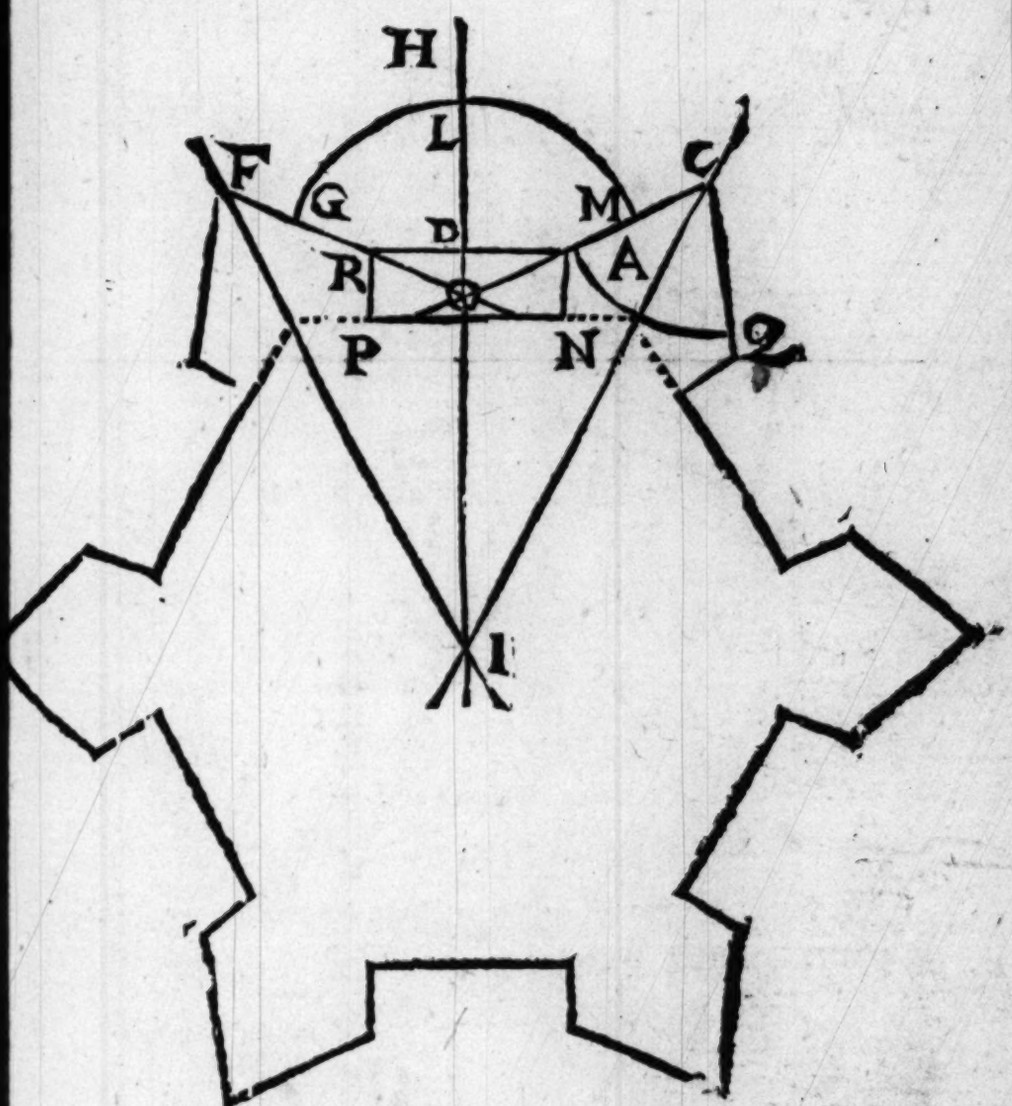
In this table you may finde the quantitie of the angles flanking and flanked, in this manner.

The angles of the figures.	The moitie of angles flanking.	Angles flanked or Bullworks.
A	C	E
4	75 0	60 0
5	70 30	69 0
6	67 30	75 0
7	65 21	79 17
8	63 45	82 30
9	62 30	85 0
10	61 30	87 0
11	60 41	88 38
12	60 0	90 0
13	59 25	91 25
14	58 51	92 9
15	58 30	93 0
16	58 7	93 45
17	57 47	94 25
18	57 30	95 0
19	57 14	95 32
20	57 0	96 0
B	D	F

The best approved Authours (for Low-countrey fortification) as Samuel Marolois, Freitag, and others, dissent much from this table.

To finde them in figure of 6 angles look in the columne B. the number of angles 6. and over against it in columne C D. you shall finde for the moytie its angle flanking degrees, 30 min. And in the columne E. you shall finde for the angle flanked 75 degrees 0 min.

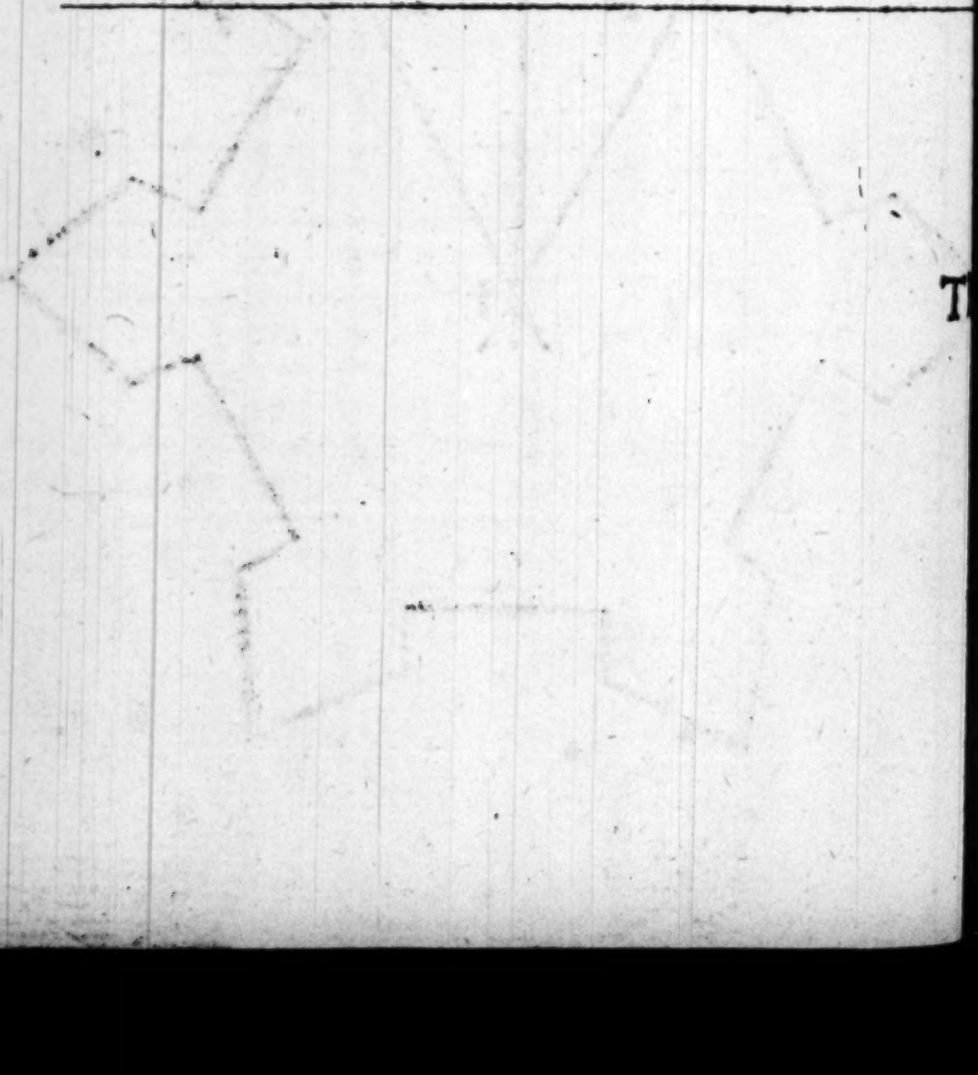
To designe a fortification of 6. Bullworks,
w the line H. I. set the compasses in O.
d make the semi-circle G. L. M. then mark L.
and L. M. each of them of 67 degrees 30 min.
en draw the streight lines O. G. and O. M. you
all have the angle flanking G. O. M of 135. deg.
after that, make the streight line R. A. which
ts with right angles the line H. I. (it matters
t whether it be near or farther off from O.) di-
de it into 5 equall parts, and give foure to each
the lines R. F. and A. C. which will make the
ces of the Bullworks. Then divide one face into
qnall parts, and give two to each of the flanks
N. and R. P. which must be perpendicular up-
the line R. A. then draw the line P. N. which
ll make the curtain.



Place the compasses on the point C. *make t*
ſemi-circle A. Q. *of* 75 *deg.* (*as is marked in t*
table) *then draw the line* C. Q. *and you ſhall ha*
the angle of the Bullwork A. C. Q. *which bei*
divided into 2 *equall parts, by the right line* C.
will make in I. *the center of the place.*

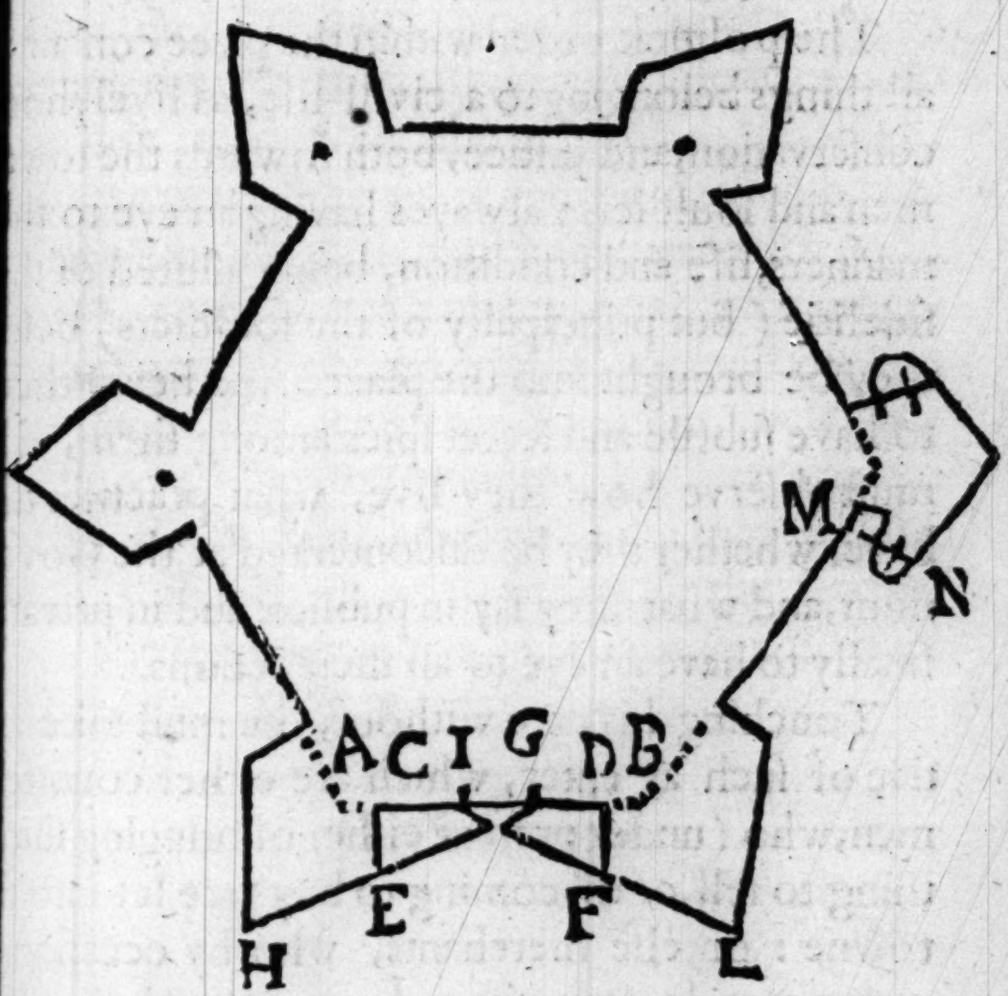
It is a generall rule, that the faces of the B
works are the foure fift parts of the curtains,
the flanks the two fift parts of the faces of the B
work.

The faces of the Bullworks, in great figur
muſt have 400 *foot; in mean figures* 350,
in ſmall ones 300. *You may forbear the preced*
table, obſerving (*for a generall rule*) *to give to*
angle flanked three fift parts of the angle of
cumference of the figure which you intend to f
tifie.



The Venetian fortification.

The distance of the one Center of a Bullwork to the other A. B. *is never longer then* 200 *Venetian paces, of* 5 *foot a pace: nor shorter then* 150, *that the line of defence be neither too short nor too long.*



B. *must be divided into* 6 *equall parts.*
C. *is the sixth part of* A. B.
E. *is equall to* A. C.
G. *is drawn from the third part of the curtain, in the figures of lesse then* 8 *sides: and from the middle of them in the figures of more then* 7.
N. *divideth it self into* 3 *equall parts, two for the shoulder, and one for the casemat.*

Of the defence of fortresses.

Chap. V.

THe defence of fortresses dependeth on the good order which the Governour observeth as well within as without the place, be it for matters politick or militarie.

The politick order within the place containeth all things belonging to a civill life, as livelyhood conservation, and justice, both towards the townsmen and souldiers: alwayes having an eye to their manners, life and condition, being assured of their fidelitie (but principally of the souldiers) before they be brought into the place. And being there to have subtile and secret spies among them, who must observe how they live, what practises they have, whether they be discontented at the Governour, and what they say in publick and in private: finally to have an eye to all their actions.

Touching his care without, he must take notice of such as enter, which are either countreymen, who (under pretext either of bringing something to sell, or of coming to buy) are let into the towne: or else merchants, who by occasion of commerce do come in and go out at their pleasure. Of these there must be regard had whether they deal with persons suspected, or that themselves be such, or whether they come from some suspected place; and not to suffer any to enter but persons of good assurance, and well known.

The militarie care hath respect either to the gates or the walls. Of the gates, either at the opening or shutting of them.

Cor

Concerning the opening of them, he muſt (be-
re the ſetting of them open) ſend out an officer
ith ſome ſouldiers, to diſcover whether there
any ambuſhes in the ſuburbs, churches, fields,
cayed buildings, hollow wayes, valleys, ditches,
cloſed gardens or woods: and at the ſhutting
them, the Sergeant Major muſt be there aſſi-
ng as often as may be, and to ſearch and feel the
ckes with his own hands.

Touching the walls, he ought to have regard
hether they be low, ill flanked, decayed, tho
oat drie; and to uſe the remedies; as alſo to
e places where the water entreth, or iſſueth out.

The gates and walls muſt be ſecured with good
rps-du-guards, and ſentinells near each other.
e muſt never ſlight the danger, but muſt alwayes
ſpect and fear ſurpriſes and treaſons, being vi-
lant and active: often viſiting his guards, and
oming upon them at unawares: that ſo they
ay fear aſmuch to be ſurpriſed by the Gover-
our as by the enemie; which courſe will hold
em to their duties.

Of the taking of fortreſſes by petard or any other ſurpriſe, or by treacherie.

Chap. VI.

THey which have an enterpriſe upon any place will ſurpriſe it either by petard, or by ſcalade or by ſome other defect which is in the gates o walls, or elſe by intelligence and treacherie.

If you would ſurpriſe it by petard, you mu firſt well know the gates, rails, barres, palliſadoes draw-bridges, bridges, pitfalls, portcullices, an grates: and the places of the flanks, whether the be on the ſides, above, or before; whether th ditch be drie or filled with water; whether it b broad or deep; whether there be loop holes ove the gate, corps-du-guards, and in what place; whe ther the entrance into the gate be right on or wind ing; and in all theſe things you muſt obſerve how many paces there may be of length, breadth height, and diſtance between piece and piece, a near as may be.

The place being diſcovered, you muſt make uſe of ſtratagems to cloak your intentions, and to divert your enemy to ſome other place.

When there be any ſuburbs, decayed houſes o any woods near the place which you intend to ſurpriſe, you may make uſe of them to facilitate your approaches, and to lay your ambuſhes, alſo the eaſier to diſcover what is done about the gates of the town, ſo to lay hold on the occaſion at the inſtant when you ſee it fair for you; and to receive advertiſements by thoſe perſons which you ſhall have ſent to diſcover the place.

Being

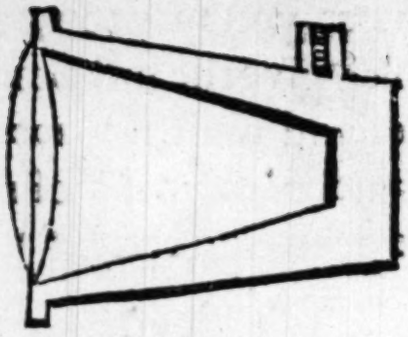
Being thus near, you may to good purpose re-
eve those which give the first onset, and dispatch
e readier; yet you must not approach so near,
that you be under command of their canon, for
ar (if you be put to the retreat) you be had by
e breech.

The time well taken doth much facilitate en-
rprises, which is usually a little before day, by
ason that the sentinels (being wearie and faint)
sleep, and darknesse favoureth the approaches,
d serves for cover of those which put the plot
practice, prepare the engines, and plant the pe-
rds, and thence gives terrour to the assailed.

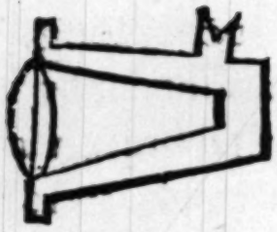
The petards must be made of fine or red cop-
r, with a tenth part of brasse. That for the
idge must be 11 inches long, and at the breech
nches and a half about, and 5 inches wide with-
The metall at the breech must be one inch
d one fourth part thick, and a half inch thick at
e neck, without reckoning the muzzel ring. The
outh must be 10 inches wide, and it must have
ree handles, and a pipe over the touchhole
ning to the breech. It must weigh from 60 to
pound of metall.

That for gates with overthwart barres, must
9 inches long, five twelve parts of an
h thick at the neck, and one inch at the
eech. The mouth 7 inches wide, 6 on the out-
e of the breech, and 4 within. It must weigh
ar upon 40 pound.

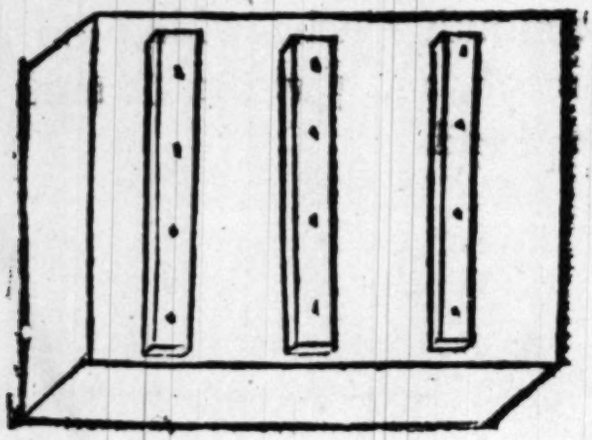
That



That for gates with plain bolts, or for palli
does, muſt be 7 inches long, one third part of
inch thick at the neck, and three fourth parts of
inch at the breech, the mouth 4 inches wide,
inches and a half at the outſide of the breech,
2 within. It muſt weigh near upon 15 pound



Between the petard and the bridge, there m
be a madrier or wooden planchier placed, 1 fo
and a half broad, 2 foot long, and 3 inches thic
If the wood be not very ſtrong, it muſt
ſtrengthened with plates of iron, being ſet
athwart on the outſide of the planchier,
lengthwiſe on the other ſide.



The charge of the petard for the bridge is om 5 to 6 pound of powder; of thoſe for rong gates from 3 to 4 pound. And for palli-does from one pound and a half to two pound. hey muſt be charged with the fineſt powder at can be had, beating it hard into the petard but not ſo that you bruiſe the grain) which muſt ſtopped with a wooden trencher or plug an inch thick, very juſtly fitted, and ſome mol-n wax to be powred on it to cloſe the rifts, and keep the water from getting in, if perchance ſhould fall into the water. The petard muſt t be charged up to the mouth, but there muſt 3 fingers breadth left, which room muſt be ed up with towe or ſuch like, which muſt be eſſed down very hard, and then there muſt be a nen cloth to cover the mouth of the petard, oſe bound with a cord about the neck, to keep n. Over the touchhole there muſt be applied opple of cork, and over it a plaiſter of wax or ch, for fear of water.

Before the petard be hung on, you muſt have a ming iron to ſtirre the priming powder, which uſt be of a ſlow mixture (that ſo the petardier y have leiſure to retire, before the reverſe of petard ſurpriſe him) and it muſt be fit to re-water. It is compounded thus; take 3 parts fine powder, 6 of ſulphur, and 9 of ſaltpeter, und each of them apart very ſmall, then mix em together in a diſh with a ſtick; then poure le of peter into it by little and little (that ſo it y not become as a paſte) and let it drie through-n the ſhadow, then lade your pipe with it.

The eaſieſt way to hang the petard at the barres gates is by a fork, as this figure ſheweth.

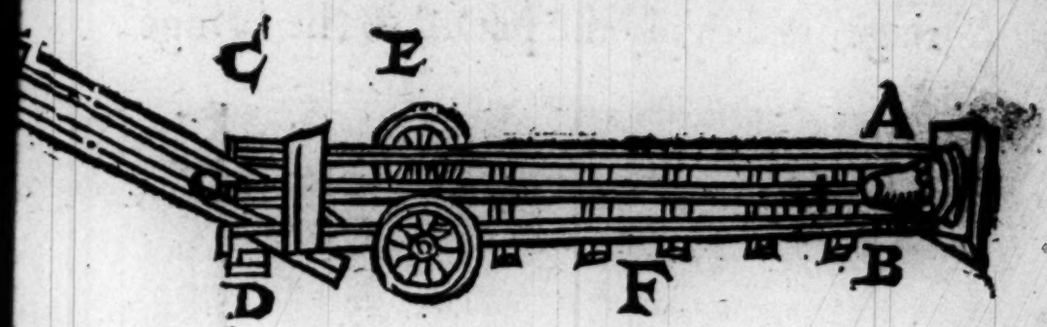
But

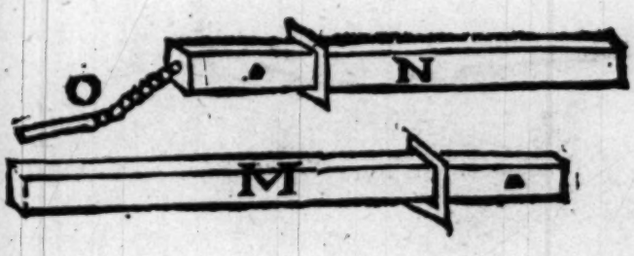


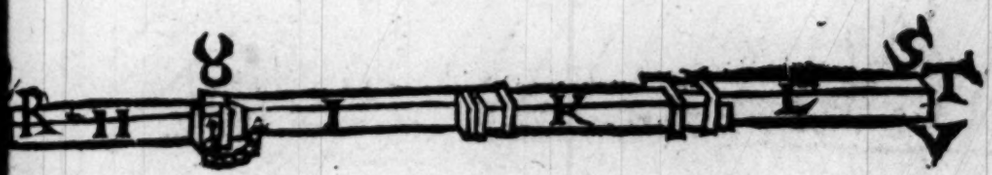
But the petard for the bridge must be applie
by a carriage, made as followeth.

It must have a counterpoise at the taile moun
ted on 2 wheels of three foot and a half high, a
two inches and a half thick, mounted on a squa
iron axletree, one inch and a half thick. The poi
of the carriage A. B. *must be broad enough to co*
tain the petard, namely one foot; C. D. 3 *foot,*
E. 20 *foot*, E. C. 6 *foot. The carriage is compo*
sed of 3 *long planks* C. A. G. H. D. B. *each*
which are made of 4 *pieces, bound about with rin*
of iron, as is shewed in H. I. K. L. *and are to*
taken asunder, to make them portable, as is seen
M. N. *And are then fastned together with t*
pin O *as is shewed by* 5. *These* 3 *planks are fa*
ned together by barres 2 *inches broad, and* 1 *in*
thick, one foot distant from each other, as in F. *T*
breadth of the planks is P. Q. 5 *inches.* Q. R.
inches, T. V. 8 *inches*, T S. 3 *inches. Along t*
plank of the middle of the carriage G. H *the*
must be a range made to lay a train to give fire
the petard.

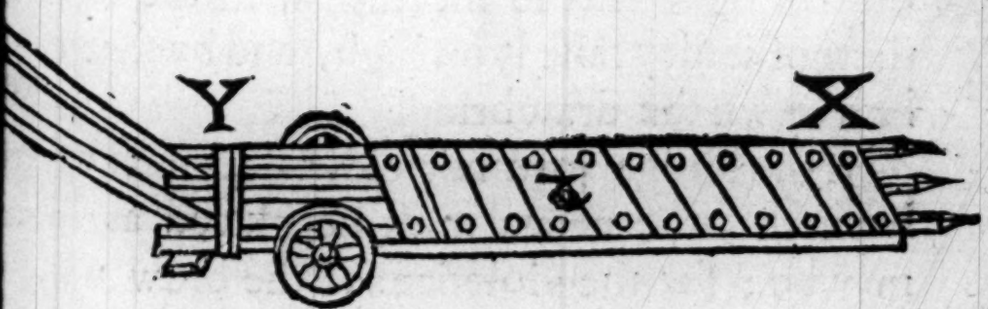
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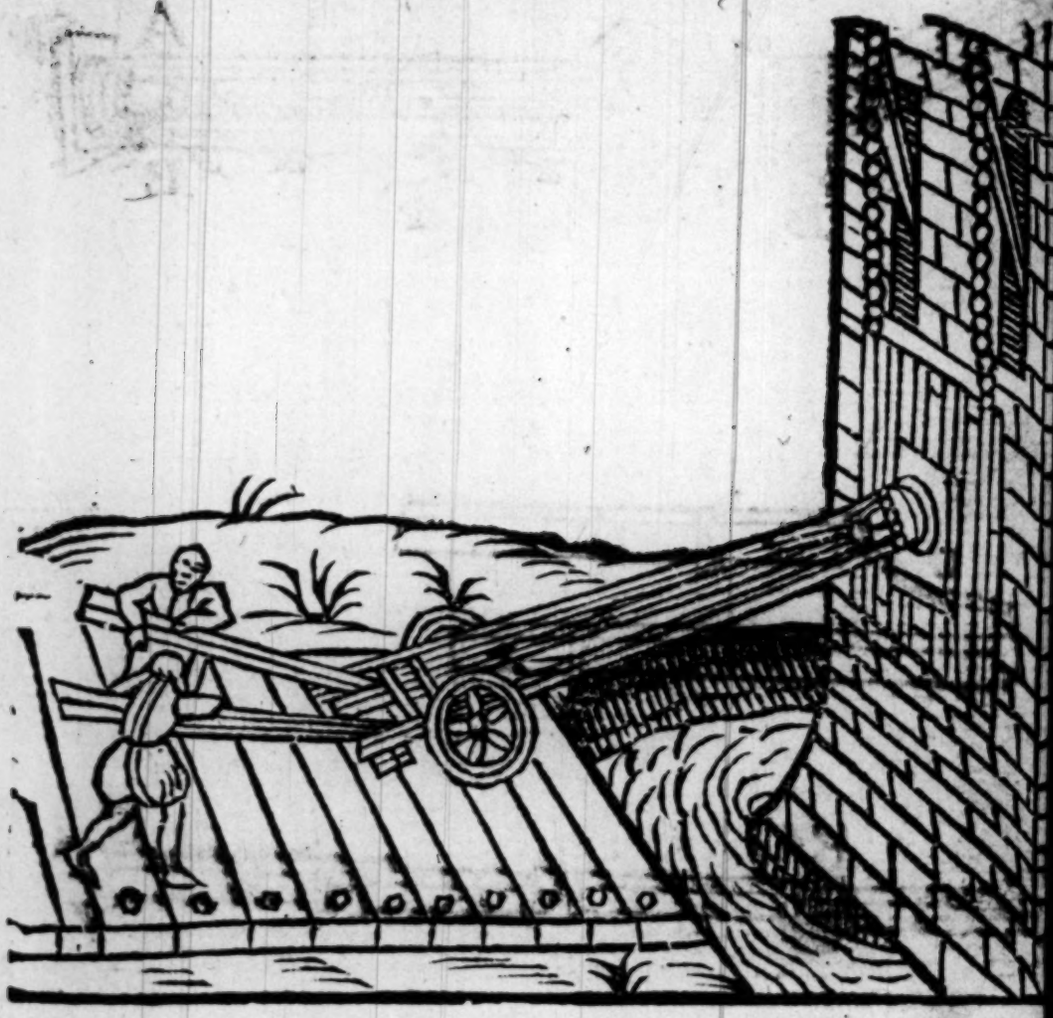




The rowling briage muſt be made even as the rriage, *ſaving that it is as broad at the end* X *as* the other Y. *and is covered with planks, as is* ewed *in* Z.



Two men may easily thrust forward the ca
riage, and apply the petard to the bridge.



When there is a gate between the bridge a
the draw bridge, the petard must be hung just
the middle of the bridge; but when there is
gate, the petard must be placed just against th
drawbridge, that so meeting with the violen
thereof, it may raise it on high, and by that mea
beat down the drawbridge.

If the bridge joyn not close aloft (as often
happeth) the petard must be placed as high
may be; for the violence of the blow which
will give against the stone-work of the gate, wi
fell it down.

To fell down a drawbridge which joyneth n
well to the wall, it may be done without petar

a tortois of braſſe placed between the wall and
e bridge, which will fell it down with the crack
it.

This tortois is made thus; Take 2 diſhes of
aſſe which are made hollow 5 inches, 1 foot
oad, and 2 inches thick; joyn them one againſt
e other, and fill them with powder.

Ordinarily the good order, and good proviſion
all things neceſſarie, cauſeth the execution to
ceed well: ſo the leaſt diſorder hindreth it.
herefore every thing muſt be commodiouſly
dered, diſtributing to ſeverall commanders the
verſitie of things which muſt be executed; as
rrive at the place 2 houres before day, to ſend
t to diſcover, to know whether the enemie be
t advertiſed, and whether he keeps himſelf on
s guards (which would give you cauſe of chan-
ng your purpoſe) to cauſe your carriages and
wling bridges to be joyned together farre
ough from the gate, that ſo they of the town
ay not hear the mule go which carrieth them,
d the noiſe of them which are to unloade them:
cauſe the petardiers to advance, each of them
rrying his fork and planchier, and on his ſide a
an carrying his petard, which ſhall make over-
re of the barres, palliſadoes, and gates, ſo that
e carriage of the petard for the bridge may
ſſe, that ſo they may fell down the bridge. If
e bridge be in ſeverall pieces, they muſt be
awn together with hooks. If one ſhaft keep up
oft, a petard muſt be applied to it. If the bridge
l into the moat, you muſt make uſe of a rowl-
g-bridge. After that, there muſt be 2 crutches,
oars, or treſſels ſet under the portcullice to hin-
r it from being let down: but if it be let down
before,

down before, it must be overthrown by the vi
lence of petards with great planchiers (if it
of wood) but if it be of iron, you must have
petard with strong handles, to fasten one or mo
bowts of iron chains about them, having hooks
each end to grasp good store of barres.

The gate being opened, you must readily s
cour the first which seized on it, charging furio
ly upon those which shall oppose and make he
against you, casting granadoes and fire-p
amongst them to disorder them, attempting
gain their barricadoes by musketiers and pik
making all possible speed (for in this busine
diligence doeth all) hindring the assailed fro
gaining time to joyn or rally themselves tog
ther, and to form a body to drive you out. Y
must place sure guards at the gate, and seize up
the corps-du-guard (which is upon the wa
and ramparts) also on the market-place, t
churches, the town-house, and all places whe
the inhabitants might assemble, fortifie, and rend
combat. You must also succour those of yo
men which shall meet with resistance, keepi
them from pillaging, commanding every man
stand firm in his appointed place; untill the guar
be placed, all the streets and parts of the town
secured, and the quarters and lodgings for eve
one be laid out. But if you would surprise a ga
of a town without petard, you must by discover
or intelligence know whether it be ill guarde
whether there be few souldiers, whether th
wander farre from their armes, whether the corp
du-guard be placed in a fit place to be surprise
whether the souldiers keep within it or about i
whether they leave the gate at any certain hour

as for their meals, their devotions, their ſports, or athering of corn or grapes.) To know whether heir commanders know their ſeverall charges, r whether they be negligent or ill obeyed, and hat therefore the guards be diſordered, whether here be any place near, fit to favour your emuſcadoes (as ditches, garden walls, hemp, corn, ollow wayes) to give on upon the gate at the pening of it, amongſt the throng of thoſe that ſue out, or a little after; for the guards (having itted their armes, and put out their matches) ay be ſurpriſed, before they can have means to cover themſelves.

You may cauſe the gates to be ſurpriſed by uldiers diſguiſed, in the habit of countrey felws, women, or merchants, bringing or conducting of wares, wood, or hay, on their backs, by rt, waggon, or boat, (if there be a river, lake, or) which may ſeize upon the gate, and hold it long till they which are in ambuſh come to reve them.

If you would ſurpriſe a place by ſcalado, you uſt firſt (by diſcoverie) know the advenues, counterſcarp, and the moat; to know whether you may come at it undiſcovered, go in and t without difficultie, and that over againſt the ce where you mean to give the ſcalado, without being compelled to take any great compaſſe out the ſame, otherwiſe you are in danger to knockt, and taken in a trap. You muſt know ether the moat be drie or frozen, or the water llow, without mud, and eaſie to wade through; ether the wall be low, ſo that it may be ſcaled, ether the place (where you mean to give on) farre off from the corps-du-guard or ſentinell,

that you may not be discovered, whether th
place be large enough to raise good store of lad
ders, and consequently for many men to enter
once; or strait, where you must enter one b
one; and to see, whether (after some of the fir
be entred) you could make a greater overtur
on the place, or at least to have time to be all e
tred before day, or being discovered, to discov
the place of the corps-du-guards, the neare
place to be ranged in battalia, the market-plac
and churches, and to cause them to be seized upo
by bataillons, sending them at one and the sam
time towards the right and left hand, and righ
forward, the grosse remaining firm in battalia
send succours where need shall require, keepi
neare some gate to gaine and open it, to let in th
Cavallrie.

A place may be surprised (at the walls
without scalado, by some defect in them;
when they are old, decayed, weak, of little thic
nesse, of brick, stone, and clay, and without ra
part, for they may easily be pierced by some e
gine or instrument: or if there be any lowe wi
dows along the curtain, or any sallie-ports, or a
sink-holes or drains for filth, or places for w
ter to passe in and out, being ill guarded a
weak.

Intelligences and treacheries may take effe
when some occasion shall give you means
corrupt the fidelitie of those of the place, whi
are able to give you entrance and deliver you t
same. These occasions will be when you sh
discover a possibilitie to convey some des
of change into their mindes, which often ha
neth amongst high-minded souldiers whi
des

esire to make a fortune; or amongst those hich are revengefull, when they be discon-nted at the Governour or some other of-cer. Besides, most of them think themselves dealt with, when they be not advanced to of-ces, having a higher estimation of themselves en they deserve; and others be so cove-us, as there is nothing which they will not ndertake for money. These and the like things ay accompanie intelligences and treache-s.

How to besiege and expugne cities.

Chap. VII.

A Citie is said to be taken by force, when it is carried with an Armie by batterie; where-to there belong three considerations: The t before the enterprise; The second, during the e of the siege; and the third, after the taking the citie.

Before the enterprise, you must consider, whe-r you ought and whether you be able to it.

You ought, when by this means you recover r own, weaken your enemie, you secure and tifie your self on that part, you encrease your enue, and you get good store of bootie. But u ought not to do it, if the charges of the ge will surmount your profit, or that will be difficult to hold the place after u have gained it, or when it is so ng, so well provided of all necessaries,

or ſo near to places of releef, that there is greate
likelihood of dammage, then hope of good ſuc-
ceſſe.

You are able, when you have all manner o
proviſion neceſſarie for the enterpriſe, and that i
ſufficient meaſure. The moſt neceſſarie things ar
money, ſouldiers, artillerie, munitions for th
armes, as powder, bullets, morters, granadoe
muskets, pikes, &c. And for the inſtruments,
ſhovels, pickaxes, hand-barrows, wheel-barrow
ſacks, baskets, &c. And for wood to make pla
forms for the artillerie, gabions, ſauceidge
blindes, boats, &c. And victuall in abundanc
The quantitie of all theſe muſt be meaſured b
that which ſhall be requiſite for the ſouldiers, t
canon, and the time that the ſiege may be like
continue, which may be computed by the pr
portion of your forces compared to thoſe
your enemie; by the qualities of the works
the place, with the number of your munitions a
artillerie; by the garriſon, with your number
ſouldiers; by the ſituation of the place, and t
releef which might be brought to it, with t
means which you ſhall have to ſtop and hind
it, and to facilitate the bringing of victuall in
your camp; by the diſtance, with the meanes
lead your armie thither; by the qualitie of t
ground, with the conveniences which you ha
to make your approaches.

And becauſe that oftentimes accidents do b
fall which were not foreſeen, as by unexpect
releef, an inundation or overflowing of waters
change of weather, a mutinie amongſt your o
men, or a contagion.

There muſt be a provident care taken for a
tre

eat, ſo as (being conſtrained to it) it may be
ade commodiouſly and eaſily without diſorder,
it may be: for thereon dependeth the honour
diſhonour, the profit or dammage of the aſ-
ilant.

During the ſiege, you muſt obſerve many
ings with good order, and principally theſe;
rſt, you muſt environ and ſhut up the place, en-
nching your ſelf round about, fortifying your
f as well againſt thoſe which might come to re-
eve them, as againſt the ſallies of the town, in
h ſort as not any perſon may be able to go in
r out; chooſing a fit place for the Armie to ſet
wn, to make the field of battaile, to make your
arters and their alarm-places. Taking care that
quarters be ſecured by good retrenchments
d forts, well flanked and guarded, within againſt
ſallies, and without againſt ſuch as might
me to releeve the place, or diſturb your Armie:
t they be commodious to receive and conſerve
munitions for actions and executions. You
ſt diſpoſe the approaches, run your trenches,
ke your way to arrive in ſafetie to the place
ere you intend to raiſe your batterie, obſer-
g that it be as ſhort as may be, ſheltered and
hfully guarded by a good number of men,
ving room enough between piece and piece,
for their reverſe, and that they command the
ce which you intend to batter; that the
nches be ample, large, deep, not ſtraitned,
ll flanked and defended by forts more or
ver, according to the ſtrength of the garriſon
ich is within the place, and to the time in
ich the releef might arrive.

During the time whileſt you are making the

trenches of approach, you must take awa
all the high flanks with the canon, then ha
ving run your trenches to the counterscarp, yo
must raise platforms with beds for the A
tillerie, near the points of the counterscarp
to take away all the low flanks, by this mea
to render the passage of the moat secure. An
whilest this batterie is a making, you mu
pierce the counterscarp, and advance yo
galleries, untill you joyn them to the Bul
work; at the same time beginning the s
and the mine. But if you be put to for
it by Artillerie, dispose your batterie so th
it may commodiously discover the place whi
you intend to batter; that there be roo
and libertie for the pieces, loop-holes, mu
nitions, guards and officers; that it be n
exposed to the Artillerie of the enemie, or b
ing so, that it be sheltered by traverses a
gabions, making it hollow underneath if y
fear mines, and retrenching it round abo
to meet with the sallies of those of the tow
furnishing it with planks and pent-houses agai
their granadoes and stone-pieces; also n
approaching too near, to prevent their fi
works and granadoes. Make your batterie
riously and in good order, battering wit
a fathome of the foundation of the wa
piercing it in divers places; then batter
acrosse to make the wall to totter. T
breach being made, you must cause it to
viewed by men chosen to that purpose, each h
ving a head-piece on his head musket pro
and a target with a long rift, and another
acrosse that. The breach must be acce

le and not too right on, capable of many ailants, having all the flanks broken both igh and low. The ſouldiers which are o give the aſſault muſt aſcend in good or- er; aſſail furiouſly, fight obſtinately, and ey muſt either be repulſed by thoſe of the arriſon, or remain maſters of the place. If ey be repulſed by the ſole valour of the ene- ie, in this caſe (without delay or ſuffering e enemie to gather breath) you muſt charge em again with freſh men and in greater num- er, ſo often, untill you enter by force; for ghting onely againſt men, it were a ſhame that greater number of freſh men ſhould not force em.

If ſome retrenchment and new fortification ade by the garriſon hath held the aſſailants om paſſing further; in this caſe, if that for- fication be weak, it muſt be forced by the p and mine, ſcaling ladders, fireworks d granadoes; but if it be ſtrong, you muſt dge upon the breach, and preſently again egin the ſap and mine and approach, and aw up ſome piece of ordinance on the each.

Whileſt theſe things above ſaid be in the xecuting you muſt moleſt the beſieged by l poſſible means you can, as by attemp- ng them by treacherie, making them con- me their munitions in ſhort time and un- rofitably, breaking the conveyances of eir waters, making feigned batteries, onfounding their ſignalls by making the ke, ſtirring up cauſes of ſuſpicion amongſt emſelves, often making falſe alarmes,

taking heed that you be not affronted by ſpie
cauſing it to be made known that you want no
thing to bring the ſiege to an end, galling them
with fireworks, granadoes, and artillerie, in thei
magazines, corps-du-guards, and alarm-places
finally giving no reſt to the aſſailed untill you hav
either forced them, or be conſtrained to retreat.

If you carrie the town by force, and remai
maſter of the place, the bootie is to be given t
the ſouldiers (principally to thoſe which mad
the aſſault) which are the priſoners and ſpoils o
the enemie, alwayes having regard to the wome
and children to deal fairly with them.

If it be commodious and advantageous to th
vanquiſher to preſerve the fortreſſe, he muſt re
pair it preſently, emptying the moat where it wa
filled up, laying plain the trenches, throwin
down the cavalleroes and batteries without, re
pairing and making up the breaches, returning th
waters into their naturall courſe if they wer
turned out, fortifying the place better then for
merly it was, if it may be, providing it of a ſuffi
cient garriſon, of good, valiant, and prudent Go
vernours and Captains, of victuall, armes, manu
factures, mechanicall inſtruments, and Apotheca
ries drugs.

If it be not advantageous to maintain the for
treſſe, he muſt cauſe it to be demantled, and all the
fortification of it to be raſed; leaving the houſe
entire, provided that afterward they may not
again fortifie there, nor endammage him.

The uſuall practices to aſſail fortreſſes.

Firſt you muſt labour to get a map or plat o
the fortreſſe, and of the champain round about

it,

and to be informed of their munitions; to
now the bigneſſe and capacitie of the fortreſſe,
e amplitude and commoditie of the market-
aces and ſtreets, the ſituations of the magazines,
wn-houſe, Governours lodging, the rampart
d walls, their height, thickneſſe, matter, and
rm, the capacitie, height and ſituation of their
valleroes. What Bullworks there be, and whe-
er they be great or ſmall, ſunk into the moat,
very high mounted, commanded or command-
g, blunt or ſharp, having eares (or orillons) and
emats, or not; full or emptie, of a large gorge,
ſtrait; made of earth, or lined with ſtone or
ck; mineable or not.

Whether the caſemats be ſeen from the cham-
n, whether they be high or low, ſingle or dou-
one upon the other, whether you can batter
m in a ſtraight line, or glancing, and whether
y have ditches before them to receive the
nes of the batterie or not.

The breadth and depth of the moat, whether
bottom be of ſtone or earth; whether it be
e or with water in it, either all or in part; whe-
r there be ſallie-ports, whereabout they be, and
m whence they can be diſcovered.

Whether the counterſcarp be of meer earth, or
h a wall of drie ſtone, or with lime and ſand.

Whether the covert way of the counterſcarp be
ad or narrow, well or ill ſheltred and flanked;
ether the parapet be raiſed above the plain, or
k low; whether it be of tranſported earth,
mingled with old ruines, or meer earth, and
ether it be eaſie or hard to be cut, ſapped, or
rced.

If there be ſuburbs belonging to the place,
whether

whether you can become maſter of them at fi
onſet, or whether you muſt be put to batter the
with Artillerie,

Whether there be other works on the outſi
of the counterſcarp, what they be, and how th
be made.

Whether the ground round about the town
command it, or whether it be levell champai
or if it be commanded, whether it be mooriſh
drie, whether it be rockie or ſandie, and wheth
you muſt approach it by traverſes or trench
and whether they be eaſie or hard to mak
whether thereabout be wood to ſerve you
the making of gabions, ſauceidges, and oth
things: whether there be convenient place to
camp the Armie ſafe from the Artillerie of
town, or whether you may encamp near the to
by reaſon of ſome advantage, or by ſheltring yo
ſelf with traverſes, or whether you ſhall be co
ſtrained to keep aloof off: Whether there
a river, and what manner of one; whether y
can divert it from them or not; whether you m
make benefit of it, or are to fear an inundation
it; whether it be wadeable or navigable, at ſom
times, or at all times.

Whether the ſituation of the place be near
farre off from other places on that ſide, wheth
it be able to get ſuccours or munitions, wheth
quickly or late, and whether you can hinder it
not, and how. Knowing all theſe things, y
muſt be informed of the munitions of the tow
the number of the garriſon, how many horſe, wh
commanders, what ſouldiers, what number of A
tillerie, as well great as ſmall; what powder, a
how much, what Enginiers, what makers of fi

work

orks, and what Canoniers; whether they be unitie within the town, or whether there be di-ſions.

The Generall being well informed of all theſe ings, being reſolved to force the place, becauſe e ſhall judge it faiſeable, he muſt ſend his oops of light horſemen to overrun and waſt the untrey round about, and to take priſoners, there-to be informed more certainly of the eſtate of e place.

He muſt lead his Armie near to the town, that ey may ſee it in battalia, cauſing thoſe to be fu-ouſly charged which ſhall ſallie out of the town skirmiſh, and by this means he ſhall diſcover e place, the Bullworks, the moat, the counter-arp, and the other works.

He muſt make his quarters in ſuch place as moſt ſecured from the canon ſhot of the town, the beſt aire, where he may beſt have the mmoditie of water (and wood if it may be) d the faireſt ſituation to make the alarm-ace.

He is to ordain the quarters of his Armie, and all cauſe the line of circumvallation to be well trenched and guarded, both againſt releefs, and gainſt thoſe of the town.

He ought not to have ſo much regard of aſ-ulting the town in that part where it is weakeſt, of the commoditie and ſecuritie of his camp d his quarters: and commonly the approaches e made from thoſe places.

The trenches muſt not begin nearer to e place then harquebus a crock ſhot, or leaſt musket ſhot, running them ſo at they be not ſeen ſtraight along by thoſe

thoſe of the town ; that they be broad and deep
well flanked and furniſhed with forts, coverin
thoſe approaches with hurdles, which are ſubje
to granadoes and ſtone-pieces.

The place of the Artillerie intended to batt
the high flanks and parapets, muſt be raiſed
high, that it may command them ; but that whi
ſhould make the breach and beat down the wall
muſt be ſunk into the counterſcarp, battering t
wall between winde and water (if there be any
or at a fathom height above the ſuperficies of t
ditch, if it be drie. The firſt is placed when yo
begin your trenches of approach, to favour ther
the other, when you lay your gallerie to pierce t
counterſcarp, this batterie makes the breac
and beats down the low flanks. Whileſt this ba
terie is a making, you are to pierce the counte
ſcarp, and to have the boats or the wood for t
galleries in readineſſe, to bring them to the fa
of the Bullwork, and to go to the aſſault ſo ſoo
as you have ſhot a breach, or to ſap and mine th
face of the Bullwork, and there to lodge in ca
you cannot advance further, and to carrie it b
force.

You muſt lodge your musketiers within th
trenches, and eſpecially in thoſe which run alon
by the counterſcarp, that ſo they may beat awa
all thoſe of the town that might appear, as well o
the curtains as caſemats.

You muſt alwayes make the breach on th
faces of the Bullworks near their points, unleſſ
ſome advantage do incite you to do otherwiſe.

The entrances to the galleries on the mo
muſt be as farre diſtant from the flanks as may be
but in ſuch ſort as they be not ſeen but of on
flank

nk. The more galleries there be, the better.
uſe your granadoes to play into the middle of
Bullworks ſo continually, that you may hinder
enemie from working there, or there placing
ir guard.

If the moat be full of water, you muſt emptie
r paſſe over it by floating bridges (which is
ngerous) or by galleries, which is not ſo ha-
dable.

You may emptie it, when there is near hand
ne place lower then the ditch, by piercing the
nterſcarp, and giving the water a courſe to-
rds the place; or elſe you may make a ditch,
l pierce the counterſcarp to cauſe the water to
into it, which is drawn out by pumps. Or
you are to make floating bridges of barrels or
ndles of cork. But if the moat be ſhallow, you
y make galleries with ſauceidges. Theſe ſau-
dges are made of faggots of bruſh wood, from
to 20 foot long, and one foot thick in dia-
ter (all ſtuffed with rubbiſh to keep them from
ating on the water) then upon theſe ſauceidges
u are to lay hurdles or planks.

f the moat be drie and of earth, you muſt make
nches: uſually to that which is drie (if a breach
made) you make neither trench nor gallerie,
t you take away all the flanks to paſſe it ſecure-
and you ſhelter your ſelf on the ſides by
rdles, bruſh wood, or gabions.

If you force the place by little and little, and
t the ditch be of a rock, you muſt make a tra-
rſe within the ditch with ſauceidges, or with
bions, or with linnen ſacks full of earth.

Having paſſed the moat, you are to give the
ault (if the breach be ſufficient or ill retrench-
ed)

ed) or elſe you are to lodge at the foot of t
Bullwork, and to go to the ſap and mine ; and a
cording to their effect you muſt give the aſſau
advance, or lodge.

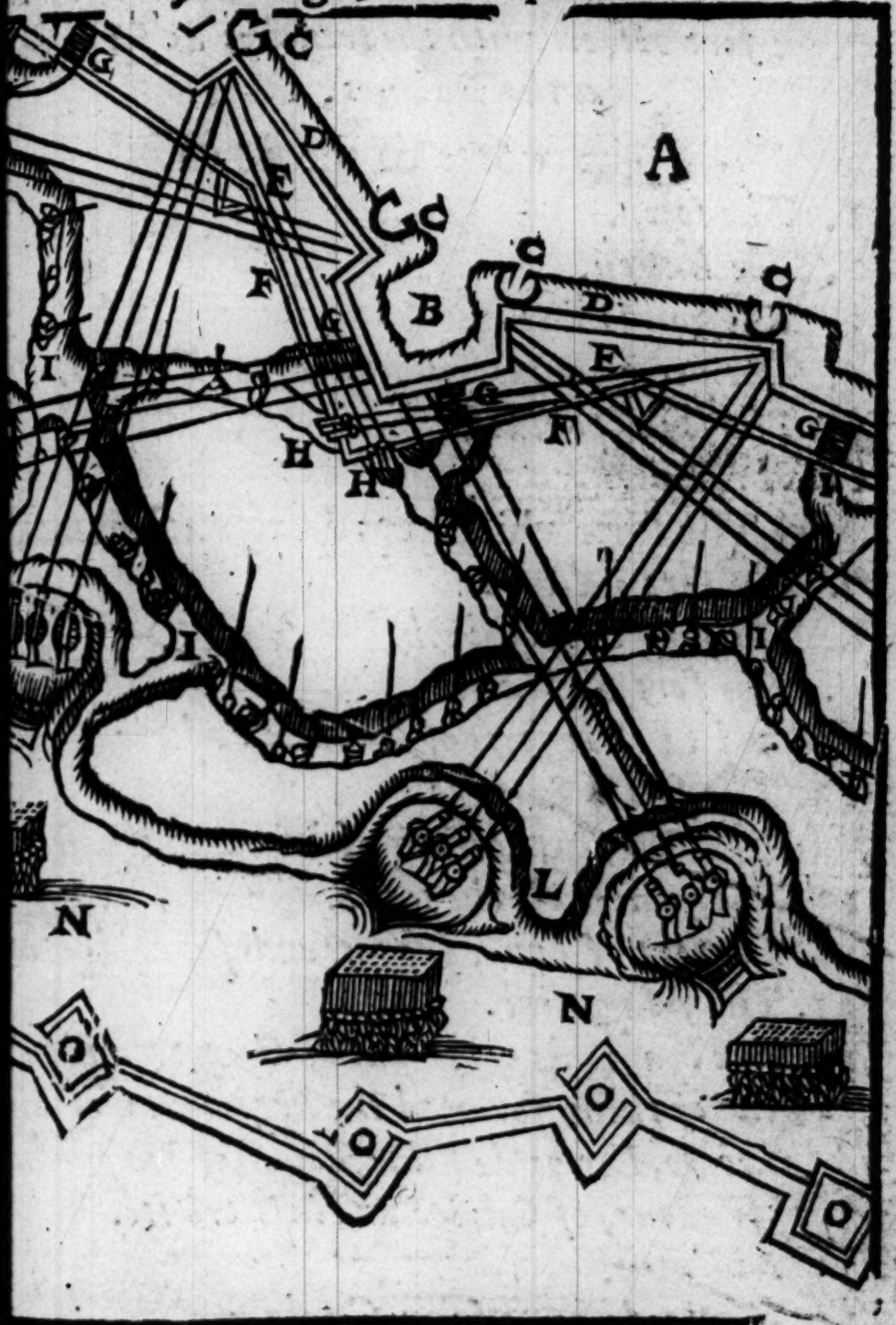
If the retrenchment of the aſſailed be gre
firm, and ſtrong, having gained the Bullwork, y
muſt there draw up and plant your ordnance, a
make your batterie the moſt ſpeedy and viole
that may be.

Nothing ſo much affrighteth the aſſailed a
furious and expedited batterie, for he hath n
leiſure to retrench himſelf, and knows not wh
to range himſelf to be under ſhelter.

That doth much wearie and moleſt the b
ſieged, when they are aſſaulted at 3 or 4 ſeve
Bullworks, at 3 or 4 corners of the town ; th
are in continuall ſuſpicion, they have their for
diſunited, they cannot prevent falſe alarms, th
labours are very great, and their guards mu
more toilſome and inſupportable. Beſides th
every man is diffident of the other guar
breaches, retrenchments, and of their endeavo
to make good defence.

It alſo much diſcommodateth the beſiegers,
their forces are diſunited, their quarters are fa
from each other, they are in danger to be hard p
to it by ſallies or by ſuccours, being ſo ſcattered.

The figures following will facilitate the understanding of this chapter.



A. *The town.*
B. *The Bullworks.*
C. *The cavalleroes.*
D. *The rampart.*
E. *The ditch.*
F. *The counterscarp.*
G. *The Galleries of the ditch.*
H. *The Artillerie sunk lowe to beat down the lowe flank.*
I. *The trenches.*
L. *The cavalleroes.*
N. *The alarm-place.*
O. *The trenches against succours.*

The

The description of the King of Spains Ar
encamped before Ostend, on the quarter of th
fort Albert, with the trenches as farre
as the Downes. 1601.

The works of the town.

1. *The town.*
2. *The haven.*
3. *The kowes fort.*
4. *The great poulder, guarded by the English.*
5. *The small poulders.*
6. *A redout.*

The forts which kept the town shut up.

7. *The fort Albert.*
8. *The fort S. Elizabeth.*
9. *The fort S. Marie.*
10. *and* 11. *The forts of Count Frederick.*
12. *The fort of S. Anne.*

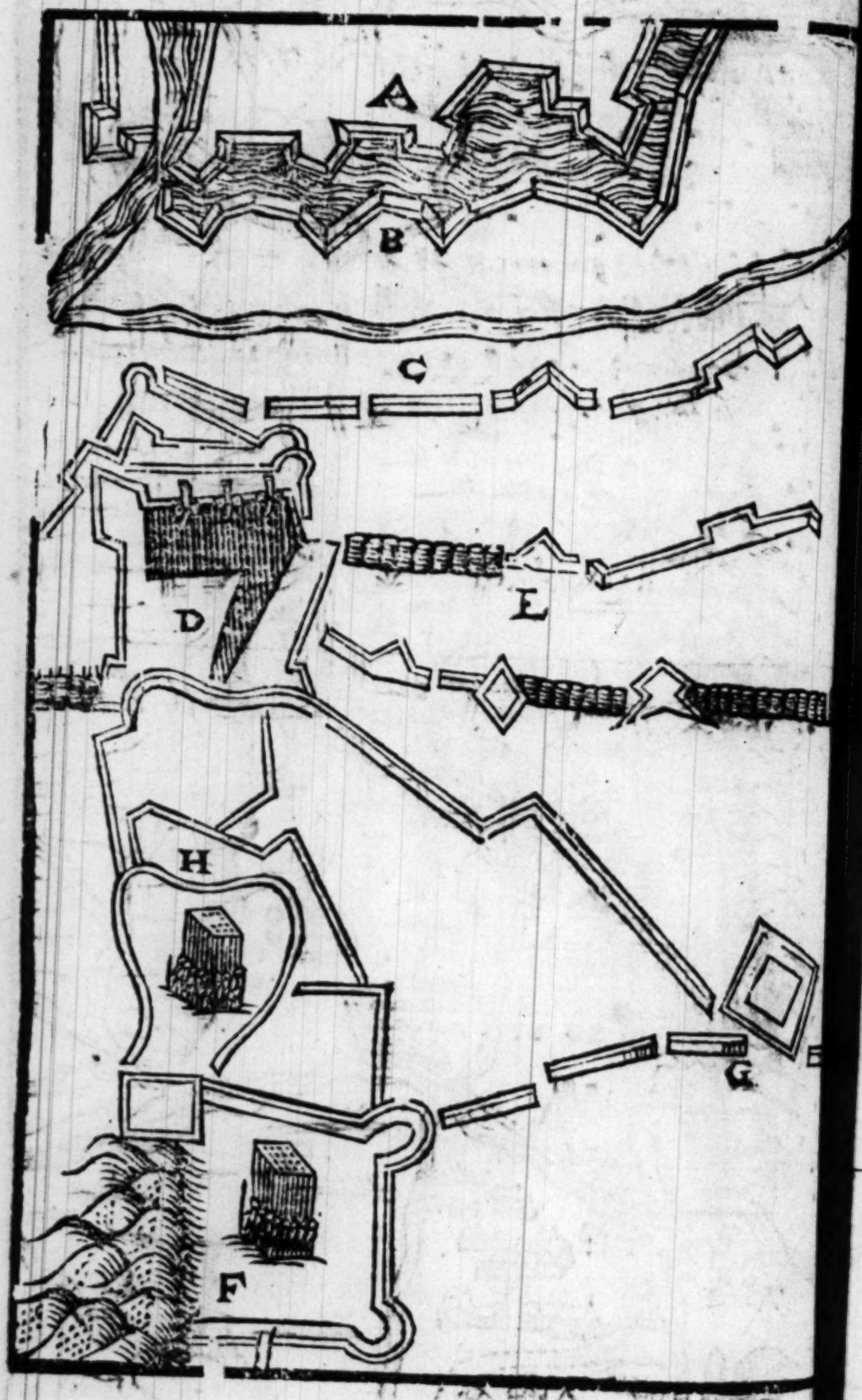
The quartering of the camp.

13. *The quarter of the court.*
14. *The port of brush faggots and sauceidges.*
15. *The Magazine.*
16. *The Spaniards come out of Guant, and in*
Rear of them followed the Regiments of Si
Antonio, Lowys de Vilar, Rivas, of Burgundi
of Wallons, of Catrice and la Borlotte.
17. *Irish men.*
18. *Spaniards come from Cambray.*
19. *Wallons of Count Fresin.*
20. *The Regiment of the Baron of Achicourt.*
21. *The Regiment of Don Alfonso d' Alvolas.*
22. *The Regiment of Count Trivulsio.*
23. *The guards of Cavallrie.*
24. *The batterie before the alarm-place.*
25. *The trenches of S Anne.*
26. *The forts of Catrice.*



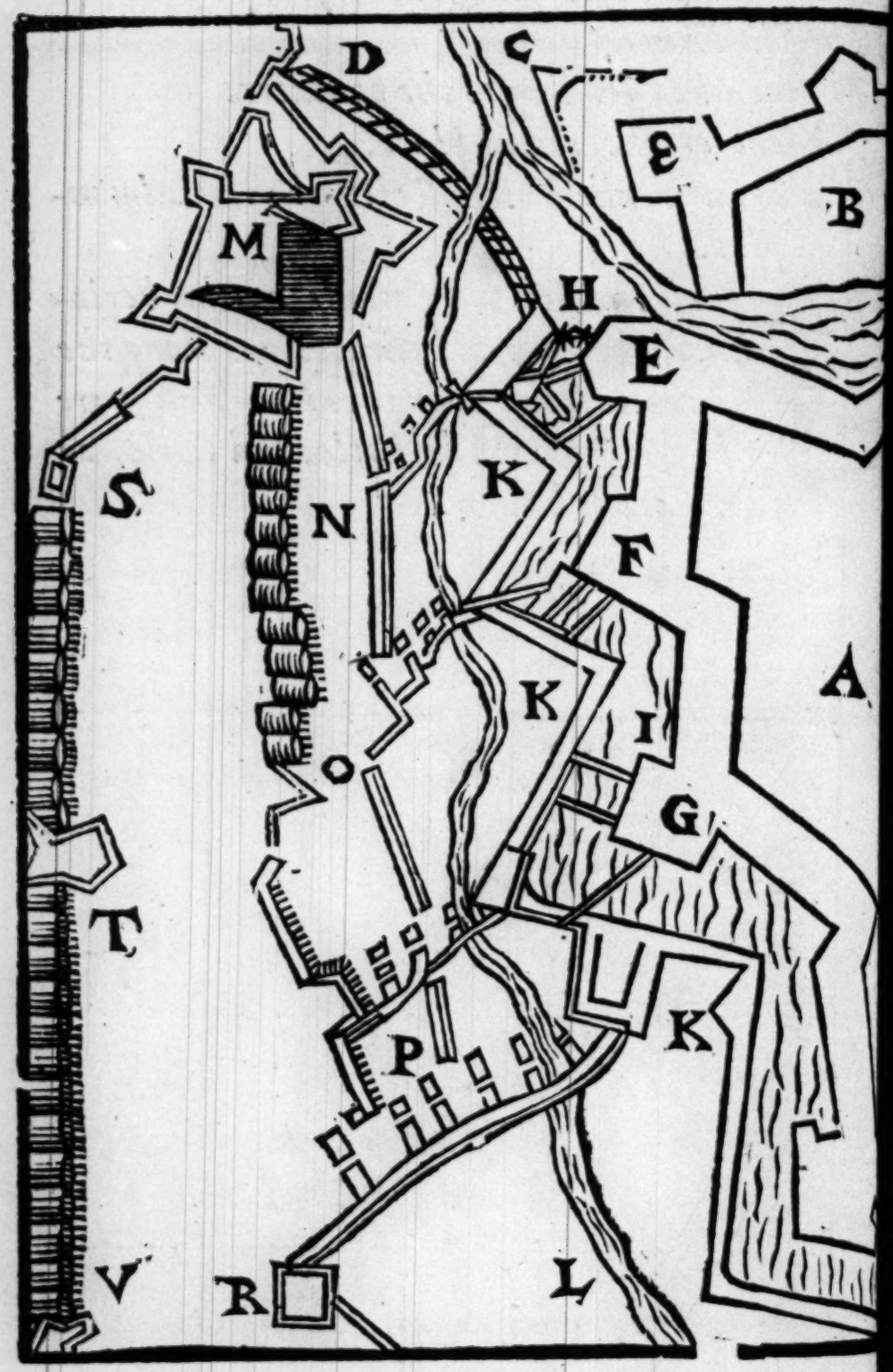
The

The trenches made before Ostend, from th
Downes on that side of the fort Albert,
to the platform.



The town.
The counterſcarp.
The channell before the counterſcarp.
The platform.
The trenches leading to the poulders.
The fort of the alarm-place.
The great trench which ſheltereth the alarm-place.
The galleries which were made at the beginning of the ſiege with ſauceidges along the Downes, to ſeize upon them; which were to be put forward by little and little, as farre as the haven.

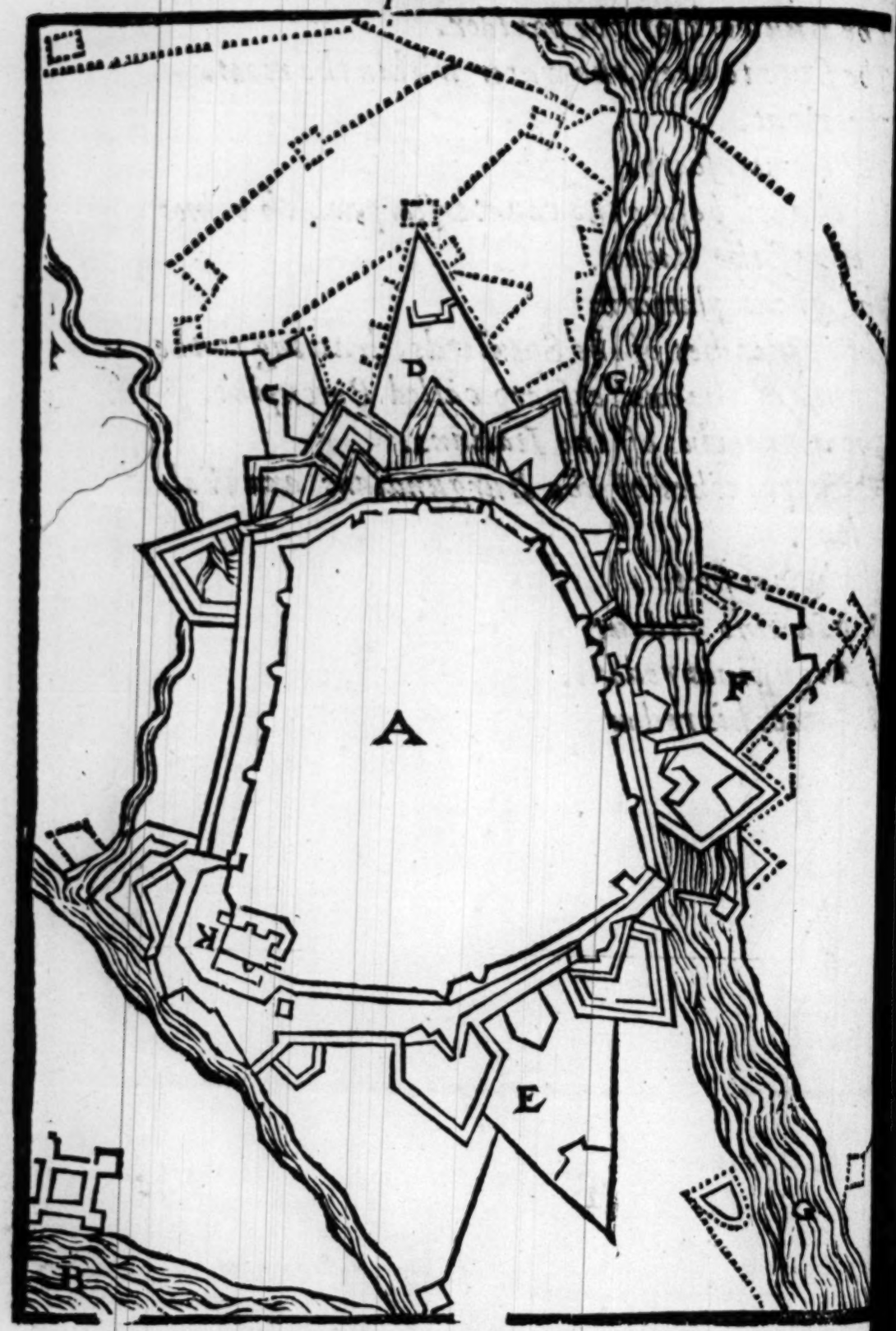
The trenches made before Ostend, from the platform to the town.



A. *The new town.*
B. *The old town.*
C. *The old haven.*
D. *The dam.*
E. *The Bullwork of Sandhill.*

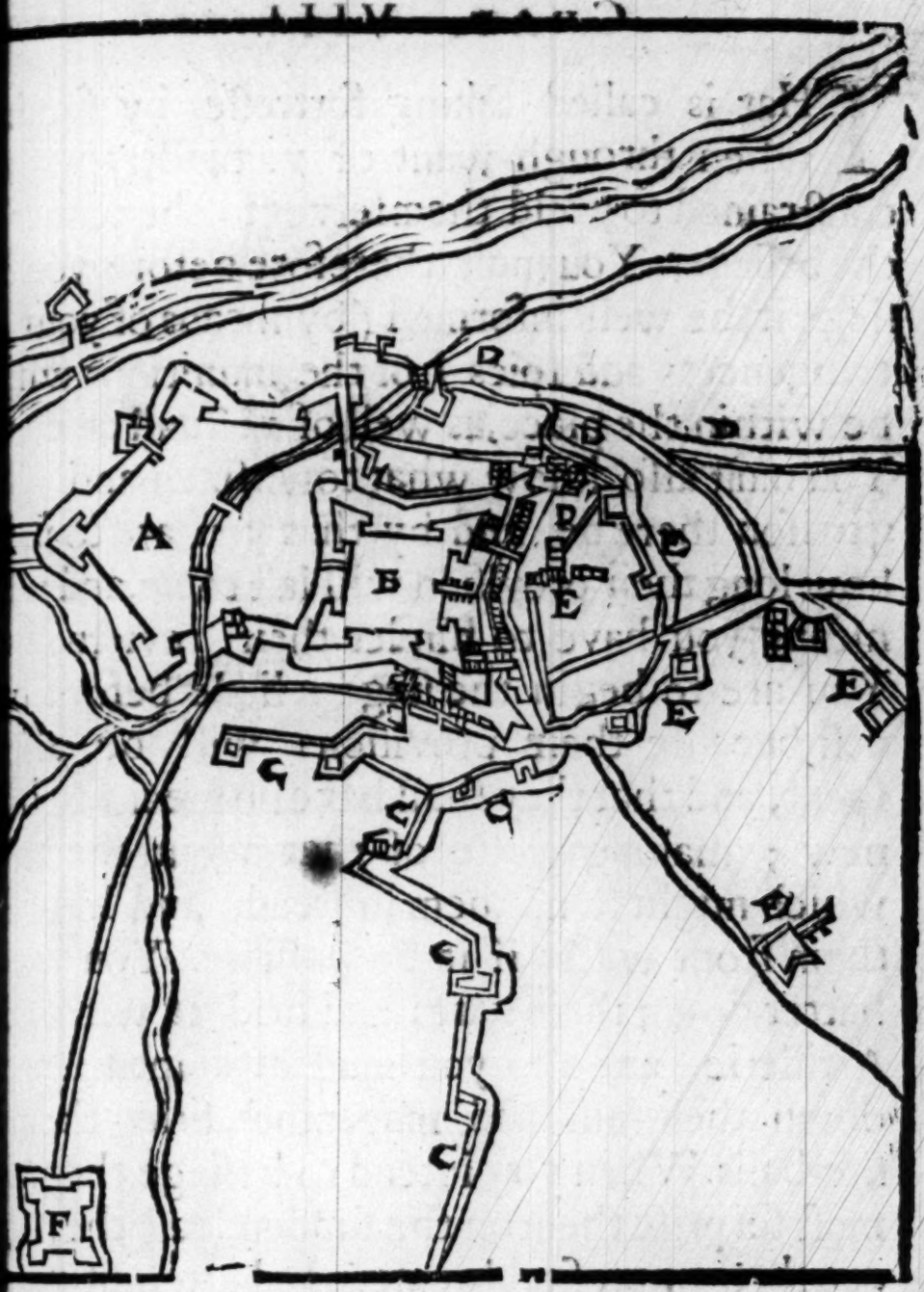
The Bullwork of Helmont.
The west Bullwork.
The Bullwork of the poulder.
The sluce to keep the water within the moat.
The moat.
The counterscarp.
The chanell before the counterscarp, which comes out of the haven.
The great platform.
The approaches of the Spaniards, drawing to the point of the counterscarp called Porcupine.
The approaches of the Italians.
The approaches of the Burgundians and Wallons.
The kowes fort.
S. Martin's redout.
S. Augustines redout.
S. James his redout.

The ſiege of Rhynberg, by Marquis Spinola. anno 1606.



A. *The town.* B. *The river Rhyne.* C. D. *T*
French quarter. E. *The Engliſh quarter* F. *T*
Friſons quarter. G. *The quagmire.* K. *The ca*
of the town.

¶ The lines ſhew the works of the town, and the pri
demonſtrate the approaches of the Spaniards.



The town.
The Caſtle.
The trenches of the Prince of Anhalt.
The French trenches.
Prince Maurice his trenches.

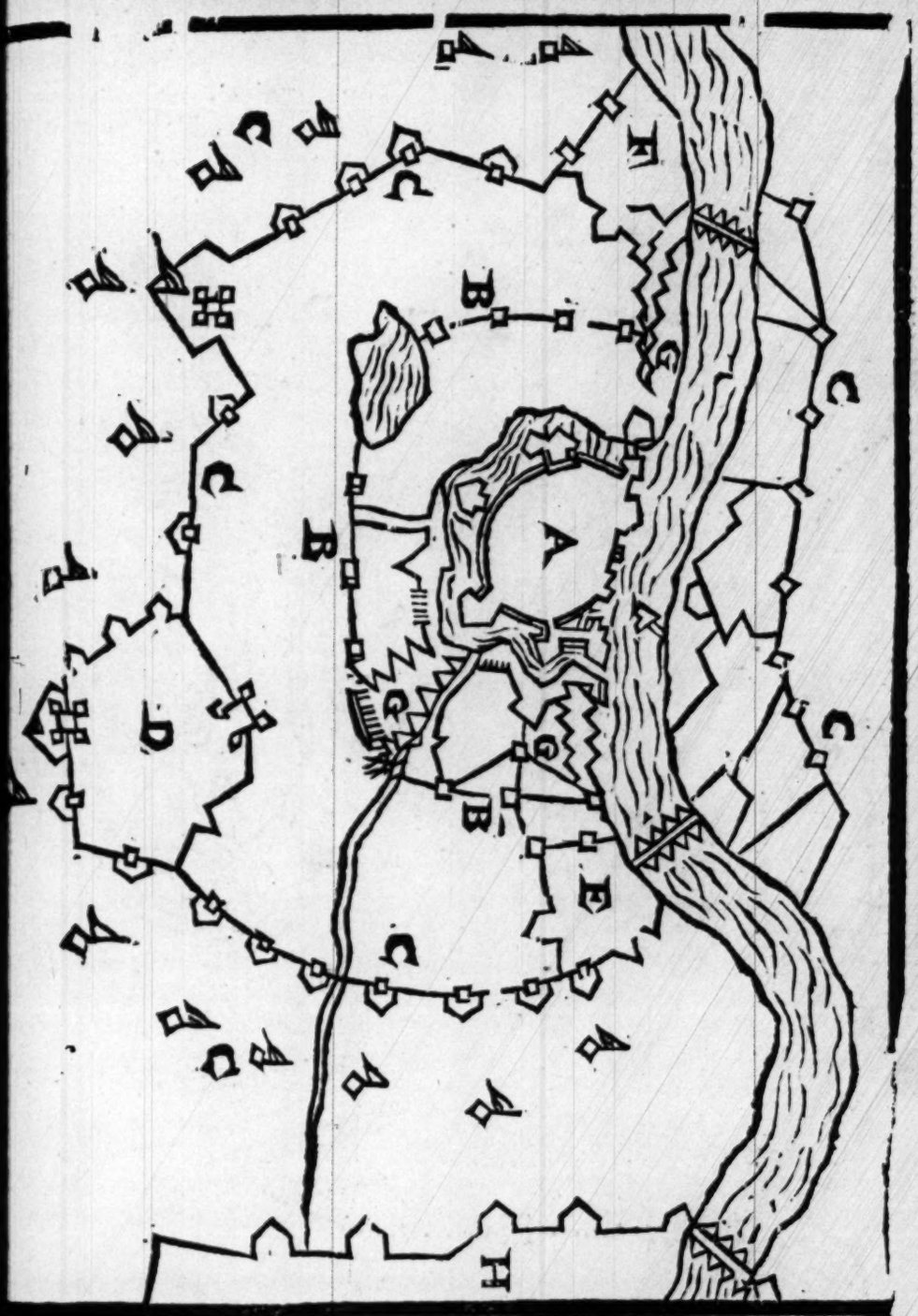
Of taking fortreſſes by famine.

CHAP. VIII.

THat is called taking fortreſſes by famin when through want of victuall, they a conſtrained to yeeld themſelves to the power the beſieger. You muſt therefore before you b ſiege it, be well informed (by means of your i telligencers and ſpies) of the munitions whi be within the place, as well of victuall as drin You muſt alſo know what townſmen and wh garriſon there be, and by that you are to jud how long their proviſion will laſt them, and wh means you have to hinder their revictuallin You are to begin the ſiege a little before ha veſt, becauſe their proviſions will be almo ſpent, and that they ſhall have no means to ha new; making waſte of that about the tow which might ſtand them in ſtead, and hindri them from water if it be poſſible. You are batter down their gates and bridges with yo Artillerie, and alſo you muſt attempt to bre down their mills and magazines, firing them fire-balls. When you intend to beſiege them, y muſt ſurpriſe them on the ſudden, leaſt they ſe out their unprofitable eaters, and attempt to pr vide themſelves. You muſt have good ſtore Cavallrie, to be maſter of the field, and alway to ſend out upon diſcoverie. The town muſt b ſhut up with trenches round about, fortifi with many good forts, that ſo you may hind their revictualling, and withſtand the force of releef, if it be to be expected: as the Prince *Mau rice* did before Grave, *anno* 1602. and befo Sluce *anno* 1604.

Grav

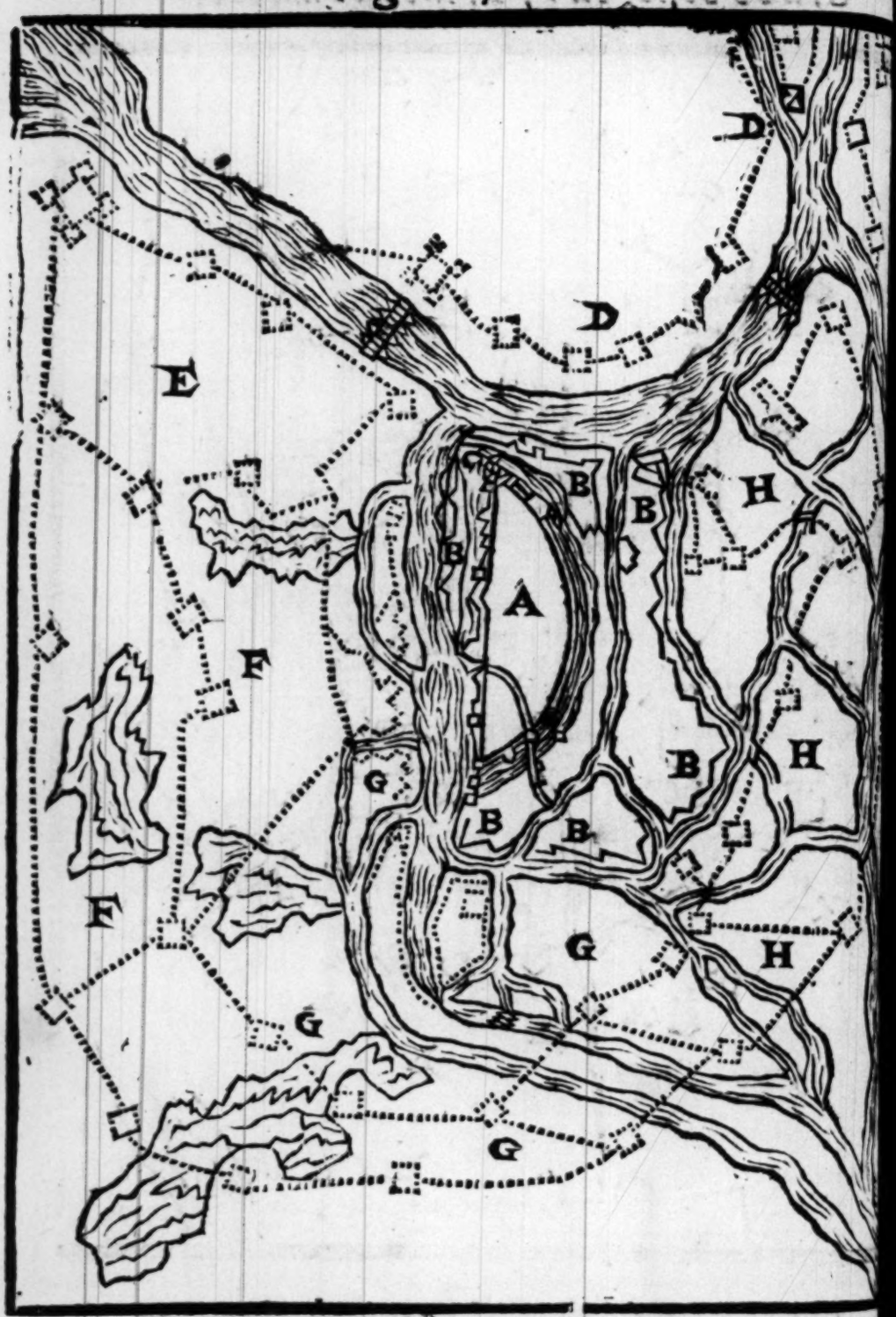
Grave beſieged by Prince Maurice.



A. The town. B. *The trenches which ſhut it up.*
C. The trenches againſt releefs, with redouts round about. G. *The trenches of approach.*
D. Prince Maurice his quarter; and on the other-ſide of the river Count Erneſts quarter.
E. Count William his quarter.
F. Colonell Vere his quarter.
H. The trenches of the Spaniſh releevers.

Sluce

Sluce beſieged by Prince Maurice.



A. The town. B. The outworks. C. The caſtle.
D. The Iſle of Caſſant, with the trenches of t
Hollanders, marked with pricks in all this figur
E. Prince Maurice his quarter.
F. Count William his quarter.
G. Count Erneſt his quarter.
H. The quarters of Colonell Dort, and Colon
van der Noot.

the defence of fortresses against the petard, and other surprises and treacheries.

Chap. IX.

THey which would prevent being surprised must have two considerations; the one concerning the attemptours, the other touching the fortresse.

Concerning the attemptours, you must (if possibly you can) have spies amongst them; at least you must keep sentinels as farre distant from the fortresse as may be, that so the Enemie arrive and be on your jack at unawares and without being discovered.

Touching the fortresse, you must not unfurnish to supply other places, so as that which remaineth be not sufficient to keep and serve it. You must appoint the place of rendez-vous for the souldiers and citizens in fitting parts of the town, and that they stirre not from their severall places without command from the Governour, or Sergeant Major, whatsoever pretence the enemie may make to charge the town in divers parts.

The lodgings of the Governour or Sergeant Major should be about the middle of the town, near some spacious place, which must be the alarm-place of the town.

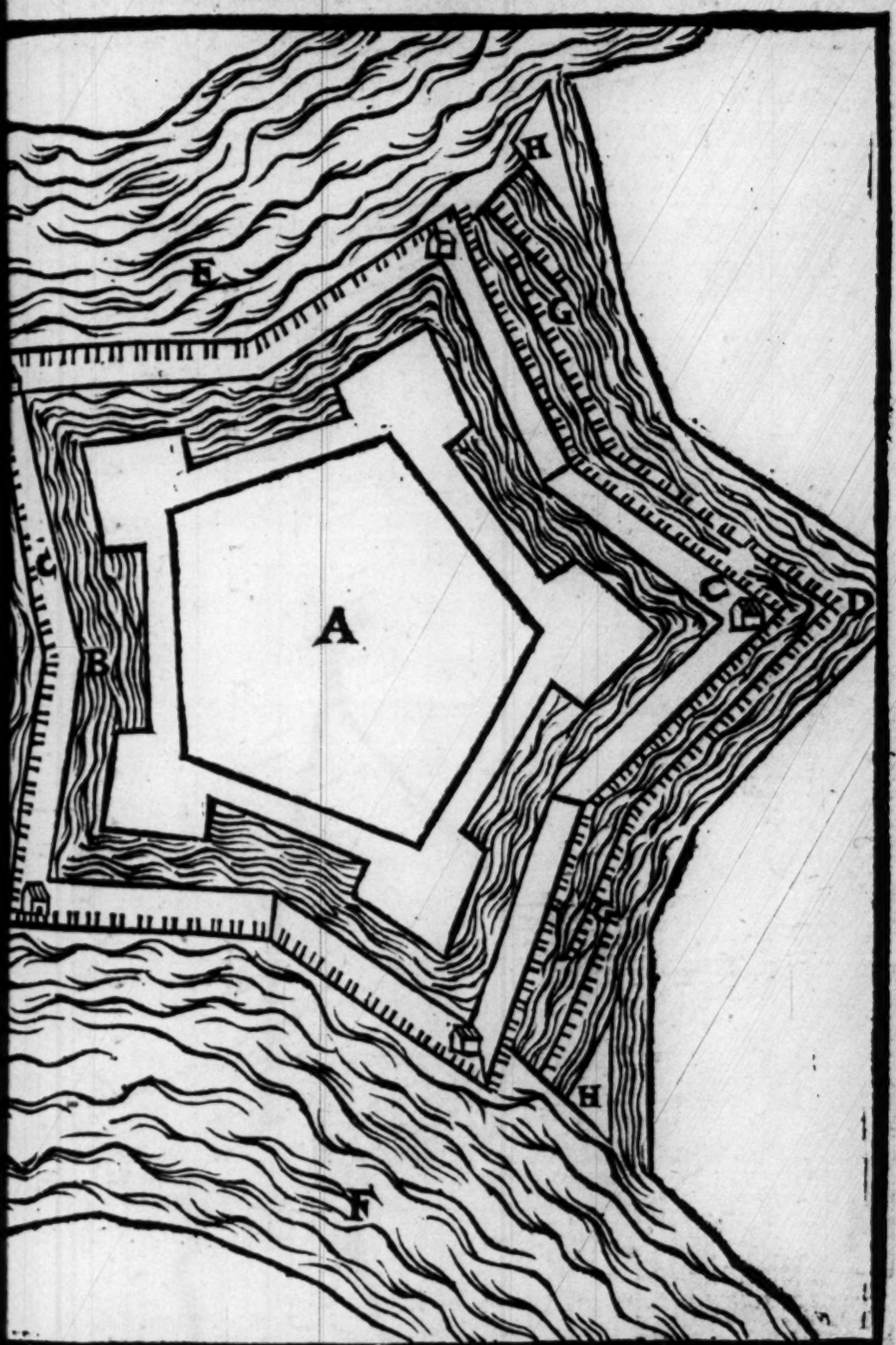
There must be iron chains at the corners of the crosse streets which are before the gates of the town: and you must batter down the fronts of the houses which are just over against the gates, with canon shot: and place one corps-de-guard in the alarm-place, another about the middle

middle of the moat before the bridge, in th
manner of a dovehouſe, into which the entranc
is by a little draw-bridge; another on every gat
of the town, into which none may enter but b
a moving plank; and others round about th
walls, near enough each to other: and theſe fur
niſhed with ſouldiers more or leſſe, according t
the capacitie of the place, and the danger.

The corps-du-guard of the alarm-place hat
the charge to make the rounds, counter-round
and grand-round, and to place the ſentinel
which muſt be at ſo near a diſtance, as they ma
heare and underſtand each others ſpeech, an
ſpecially at the corners and the chanell holes, o
drains of water.

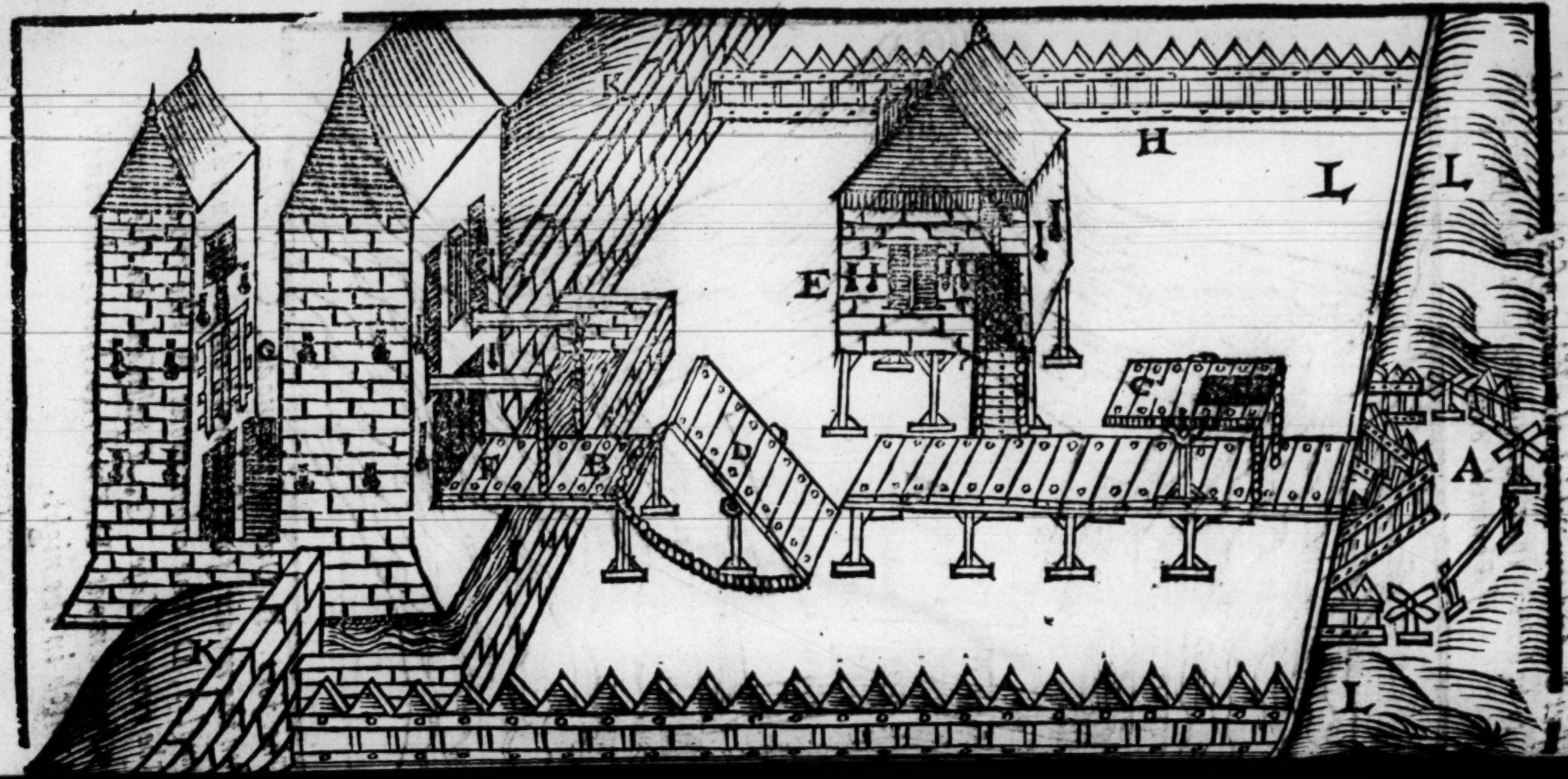
You muſt place ſentinell-perdues without th
town, which is the charge of the corps-du-guar
which is without before the bridge. If the
be a dam of earth between two moats rou
about the town, there muſt be guards placed
the night, for that is a moſt ſecure remedy agai
ſurpriſes. This dam of earth may be apprehen
ed by the figure following:

e fort S. Andrew which the King of Spain caused to be built in the Low-countreys, in the Isle of Bommell. anno 1599.



The fort. B. *One of the moats.* C. *The dam be-een the moats, fortified with corps-du-guards on angles.* D. *The other moat.* E. *The river Wael.* *The river Mase.* G. *A pallisado in the middle he second moat.* H. *Two ravelines, wherein they t watch in the night.*

The building of the gates of ſtrong rampierd town, ſhould be after this manner.



A. *The palliſade and the barres.* B. *The bridge* rmant. C. *The trap-bridge.* D. *The turning-* dge. *It were better to place it within the two* ers G. *without any other ſtay or prop ſave onely* tampin *within the wall.* E. *The corps-du-guard* lt *within the moat.* F. *The draw-bridge.* G. *The* tcullice. *If the moat be drie, you muſt there make* two palliſadoes H. *and ſink the ſmall ditch* I. *ſo* as *the water, or very near it.* K.L. *The breadth* he *moat.*

The gates and bridges muſt be flanked on both s, and on the upper part with loop-holes, ich muſt be large enough to caſt water out at m, alſo pieces of timber, ſtones, granadoes, to nch the fire of a petard, to beat it down, and ill the petardiers. But not ſo wide that ſur-ſes may be made by them, and there to give ſcalado. Some place a portcullice there, hung a rope, which is very fit to beat down the pe-ds.

If you make half moons before the gates of town, they will be the ſtronger, and the bet-ſheltred from the champain.

You muſt keep a light piece of Artillerie (but ing a great calibre) at the corps-du-guard of gate, which muſt be charged with car-ches and rubbiſh or ſtones, to turn it towards place where the enemie ſhall give on.

The moats muſt be deep, having a palliſado in middle; ſuch as have water need not be full, that facilitateth the boats for the ſurpriſe.

The curtains and faces of the Bullworks muſt ſeen and diſcovered by the flanks of the vn, even by the low flanks, that ſo the canon y ruine all the ladders which might be at-pted to be there raiſed.

The

The curtains must be high and out of dang
of scalado, if it may be.

The holes by which the water comes in,
drains of filth passe out, ought to be very strai
built of lime and stone, oblique within the wa
bound with strong grates of iron, having a corp
du-guard or a sentinell on the wall just ov
against the said grate.

To be well assured of the gates and walls,
way is to appoint good guards, and those d
gent, strong, and well placed: those on
walls must be set presently after the shutting
the gates before night; and they must not
dismissed untill day, and untill the sentinell
the steeple hath given the signall by the bell;
that no man knoweth the place where he sh
be placed untill the very instant that he entr
the guard.

You may prevent treacheries knowing
cause; for either it proceedeth from the G
vernour who hath evill entreated, disgraced,
offended the souldier in his reputation, person
means, and provoked him to an evill disposition
or it proceedeth from the souldier who is a
bitious of honour and degrees, or covetous
greater means; or else from the citizens w
are tyranniſed over by the garrison.

This matter is so tickliſh, that the very susp
cion is puniſhable; but the better way is to d
semble it, and to cause the matter to be furth
attempted; mean time doubling your roun
and making extraordinarie counter-rounds.

Chap. X.

A Fortresse is said to have resisted the enemies forces, when (having well defended it self) remaineth in its former libertie. To do this, u must draw into the fortresse whatsoever will usefull for you, and ruine all without which ght endammage you; laying flat houses, oods, barns, mills, hollow wayes, gardens, foumns, and whatsoever might batter you and comnd your defences.

Take good heed that the fortresse be well disfed to resist the assault of the enemie; which hat the flanks (whether they be high or lowe) y discover, and not be discovered but by imcking, that is, the canons mouth: that the counmines be well disposed and convenient; that counterscarp (which is the buckler of the forsse) be flanked, sheltred, and spacious; that the emats be secured and well sheltred, spacious, fit to discover the plain of the opposite bullrk, and within the moat; that the sally-ports be ured, sheltred, lowe, and commodious; that parapets be of earth or unburnt brick, and that platforms for the ordinance be made handnely and even, that so the pieces may easily be ved and removed into their places, spacious for motions, pioners, and canoniers, and to conn the munitions.

The number of the souldiers of your garrison u are to proportion according to the bigneſſe the place, to the outworks which you would ld, to the labour of the retrenchments which

you ſhall think fit to make, and to the ſalli
which ſhall be requiſite.

The Governour muſt be courageous and e
pert by long practice in aſſaulting and defen
ing, having been beaten to ſuch ſervices.

The ſouldiers ſhould be men of choice, re
lute, ſtrong, obedient, and faithfull.

The quantitie of proviſions as well for v
ctuall and medicines as armes, muſt be meaſur
by the time which you ſhall conjecture that t
ſiege may continue.

And their qualitie muſt be for the victuall
ſorts of grain, principally pulſe, powdred fle
ſalt-fiſh, cheeſe, butter, ſuet, oyl, ſalt, freſh w
ter, wine, beer or cider, vineger, candles, torch
ſhip-pitch, good ſtore of coals, and plenty
wood for the ovens, for the corps-du-guard, a
for houſhold uſes.

To tend them which are hurt and ſick th
muſt be phyſicians, chirurgeons, & medicamen
as well for contageous diſeaſes as thoſe whi
are ordinarie, and for wounds; and good ſtore
old linen.

A good quantitie of defenſive weapons,
corſlets, taſſes, morions, headpieces of proof, c
raſſes, targets both proof and ordinarie: ſtore
armes offenſive, as well ſharp, as pikes, [a] lanc
halberts; as fire-weapons, as great and ſm
Artillerie, morters great and ſmall, muskets, h
quebuſes a crock, callivers, cartouches, croſſeba
ſhot, bullets of iron and lead, lanterns, creſſ
lights, match, powder of a great, mean, and ſm
grain.

[a] *when they were in uſe.*

For the fires as well ſimple as compoun
for the ſimple, powder, ſaltpeter or ſalnitr

co

al of willow or ſallow, campher, ſulphure, re-
ne, peter-oyl, linſeed-oyl, ſpike-oyl, tarre, Ve-
ce-turpentine, colofonie of Spain, black pitch,
reek pitch, Spaniſh pitch, wax, tallow, varniſh
the ſeed, maſtick, ſal armoniack, common ſalt,
ickſilver, vitrioll, *aqua vitæ*, vineger, frankin-
nſe, wood in abundance, of vine-trees, fir-trees,
nes, oſiers, hemp-ſtalks, of laurell, olive, and
her fat and drie woods: for compounded
es which are uſed at an aſſault, pitcht ropes,
e-balls, granadoes, fire-wreathes, and fire-
nks.

Good ſtore of maſter founders, armorers, car-
nters, maſons, forgers, miners, ſaltpeter-men,
wdermakers, millers, cartwrights.

Inſtruments or tools to make carriages for
e Artillerie and musket ſtocks; ſome to cut,
hatchets, hooks, ſawes, axes, adzes; to knock,
beetles, hammers, mallets, crows of iron, and
ndſpikes of wood; to quench the fire, as lad-
s, buckets of wood and of leather, portable
es or tubs, ſquirts, iron hooks or cromes; to
nage the earth, as cutting ſpades, hand-bar-
vs, pickaxes, ſhovels, ladles, mattocks,
heel-barrows, tumbrels, ſcuttle-baskets,
unds.

Wood for the carriages, beds for the ordi-
nce, palliſadoes, barricadoes, bridges, barques,
ceidges, hurdles, gabions, piles, ſummers, joyſts
d ſmall joyſts.

Metals; as copper, tin, lead, iron.

Materials for building; as ſtone, brick, lime,
ay.

Good ſtore of linen cloth; cordage, tow,
edles and thred.

You muſt agree with your friends without o
ſome means to give them advertiſements ordin
rily when you ſhall be ſo ſtraitly ſhut up, as yo
muſt have recourſe to ſignes.

When the enemie ſhews himſelf to begin h
enterpriſe and to beſiege you, his Armie being
move divided by reaſon of the diverſitie of occ
ſions, you muſt labour to diſcommodate him
much as may be.

During the time that he ſhall be buſied in ſhu
ting up the town, in taking and cutting off t
paſſages, it might happen that (in diſtributing
his troops) ſome one may fall into your hand
then lay hold on the time and occaſion, of the
tuation, of the commoditie and favour of yo
outworks, never abandoning them but upon gre
conſtraint.

Then in ordering of his quarters you muſt ha
an eye, that even upon this occaſion you mig
moleſt him; nevertheleſſe if you conceive th
by ſuffering him to go on ſecurely, you ſhou
have means afterward to offend him to great
effect, you may defer it untill then: for thoſe di
commodities which ſucceed with loſſe of th
which one poſſeſſeth, bring double dammag
Nevertheleſſe you muſt take great heed not t
ſtay ſo long as that he be fortified, whether it be
his trenches, quarters, or lodging of his munitio
and Artillerie.

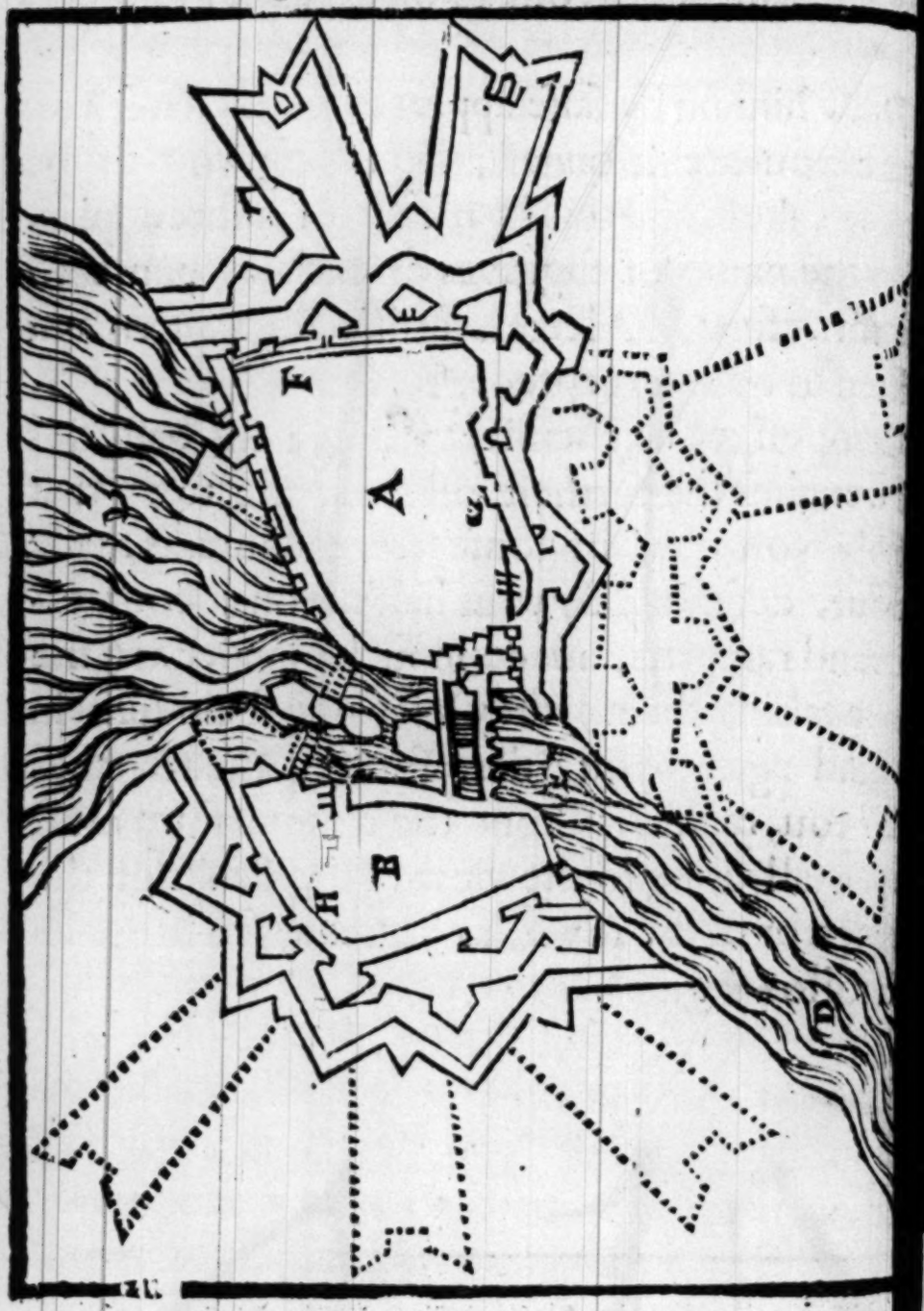
When he ſhall begin his trenches, and mak
platformes to plant his ordinance to batter you
hinder him and moleſt him with all your powe
(which you ſhall hardly do if he hath earth an
wood) obſerve the imperfections of his work
whether they be ſtraitned or ſcant, imbocke
n

t well ſheltred, ill flanked, ill conducted, ill arded, and endeavour to make benefite there-

Draw him on by falſe appearances to aſſault you ere you are ſtrongeſt, he taking you to be re weakeſt, and this by means of aſſured ſpies, der the name of fugitives or ſuch as come to n for refuge, or letters artificially written and fered to be intercepted.

Compell your enemie to begin his batteries trenches the furtheſt off from the town that ſibly you can, by ſome retrenchments made hout, defended by your half moons, counter-ps and ramparts, made in ſuch manner as (the mie taking them) they may not ſtand him in ſtead againſt you; therefore all the trenches ch you make without the counterſcarp muſt pen all along to the view of the flanks of the lines, or of the town, as you may ſee in the fi-es following.

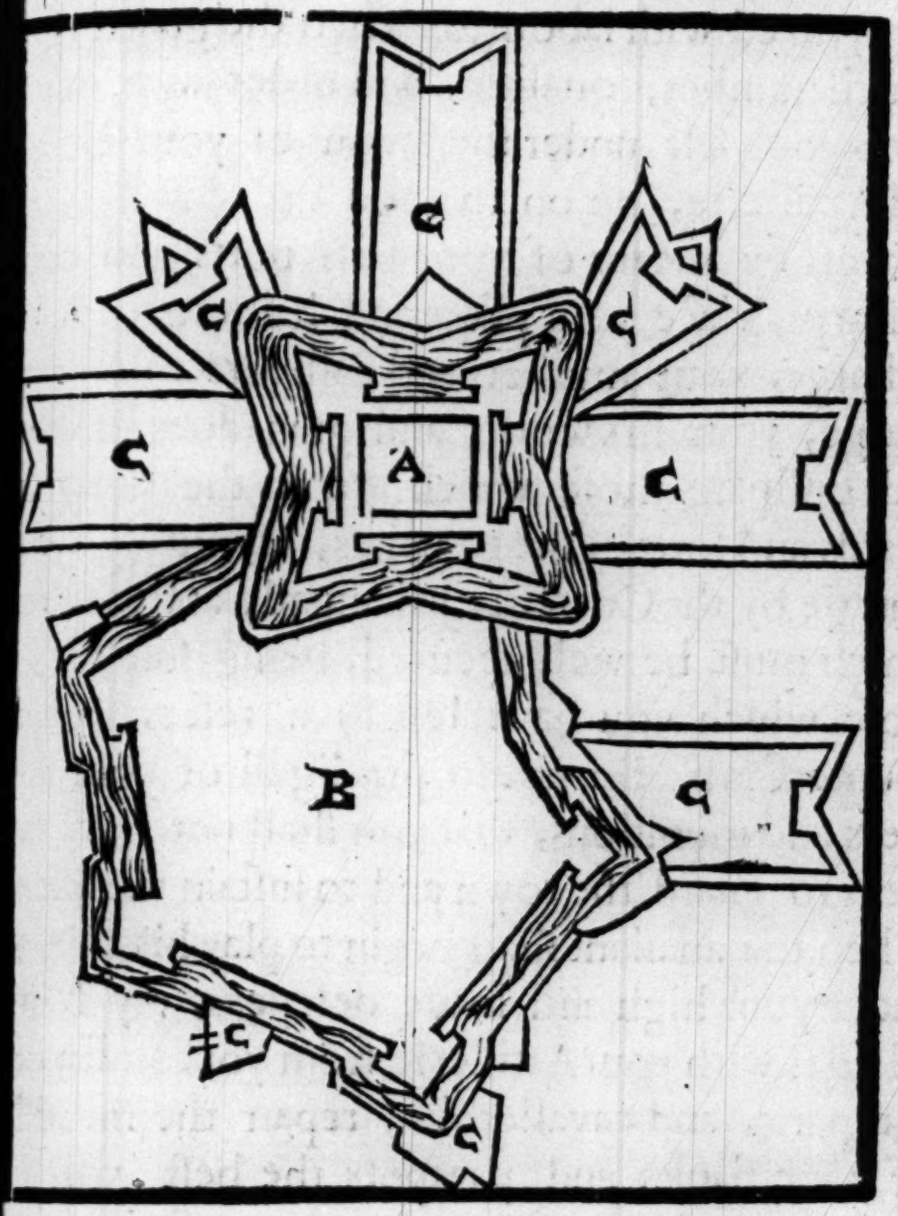
The plat of Geneva. 1611.



A. *The town.*
B. *S. Gervaſe.*
C. *The lake.*
D. *The river Rhoſne.*
E. *The Iſle and the bridges,*

The lines repreſent the fortifications made, the pricks ſhew the deſignes of thoſe which are made.

he plat of Gulick, fortified by Prince Mau-rice after the taking of it.



The caſtle.
The town.
The retrenchment made about the town.

For your ſallies, take good heed to the tim
whether it be fitting or contrarie; to the occ
ſion, as when the enemie is wet, ſtiff with col
ſleepy, tired with labour, or when the guard is n
in ſuch number, qualitie, and order as it ough
Keep your ſelf under the favour of your ramp
and Artillerie, go on in good order and at u
awares, by means of your ſally-ports and cou
terſcarps, place your pikes and halberts to ſuſt
a charge, your muskets and callivers to give t
charge, your fireworks and granadoes to bre
and diſſipate thoſe which are in the corps d
guards and forts of the trenches, favouring the I
fanterie by the Cavallrie, principally at the retre
which muſt be well ſecured, being ſuſtained
thoſe which you have left as a reſerve on t
counterſcarp. Be not ſo prodigall of your ſo
diers and munitions, that you ſhall not have ſu
cient to guard the town and to ſuſtain the aſſau
When the aſſailant ſhall begin to play his canon
batter your high and lowe defences, ply him
all ſides with your Artillerie from your Bullwor
ramparts, and cavalleroes; repair the ſhoulde
of your flanks and parapets the beſt you c
Make new places of retreat and new flanks, pri
cipally concealed ones.

When he ſhall pierce your counterſcarp
open your moat, he will at the ſame time batt
your walls; if he have forgotten nothing of th
diligence which is requiſite, you ſhall hardly hi
der nor offend him. But if he do miſtake, ſei
you on the occaſion, and have a watchfull eye,
if his Artillerie be diſcovered, you ſhall ende
vour to diſmount his pieces, to kill his canonie
to ſpoil his munitions; if it be ill fortified, ma

furious ſally upon it, to diſmount and nail it up, aking uſe of your Artillerie and muskets.

If the aſſailant be well experienced, whileſt he battering you to make a breach, he will batter the low flanks which flank the place where he endeth to give the aſſault (the high flanks be- already taken off before the Artillerie was ought on the counterſcarp) but not before he come maſter of the moat, if it be drie, or of the unterſcarp if the moat be full of water; making platform for the Artillerie upon the gallerie ich pierceth the counterſcarp to enter the at, keeping the boats and galleries to paſſe over moat ready to lay ſuddenly when the time and caſion ſhall be fit to give the aſſault; or elſe to nt them during the batterie under favour of Artillerie and musket ſhot. Now, againſt all s, an expert Governour will keep his flanks hid- n, which being opened unawares will much en- mmage the aſſailant. who (having made a ach) will cauſe it to be viewed by armed men n which you muſt not ſpare your faulconet t, nor that of the harquebus a crock) and ordi- ily they are of the moſt able and valiant men.

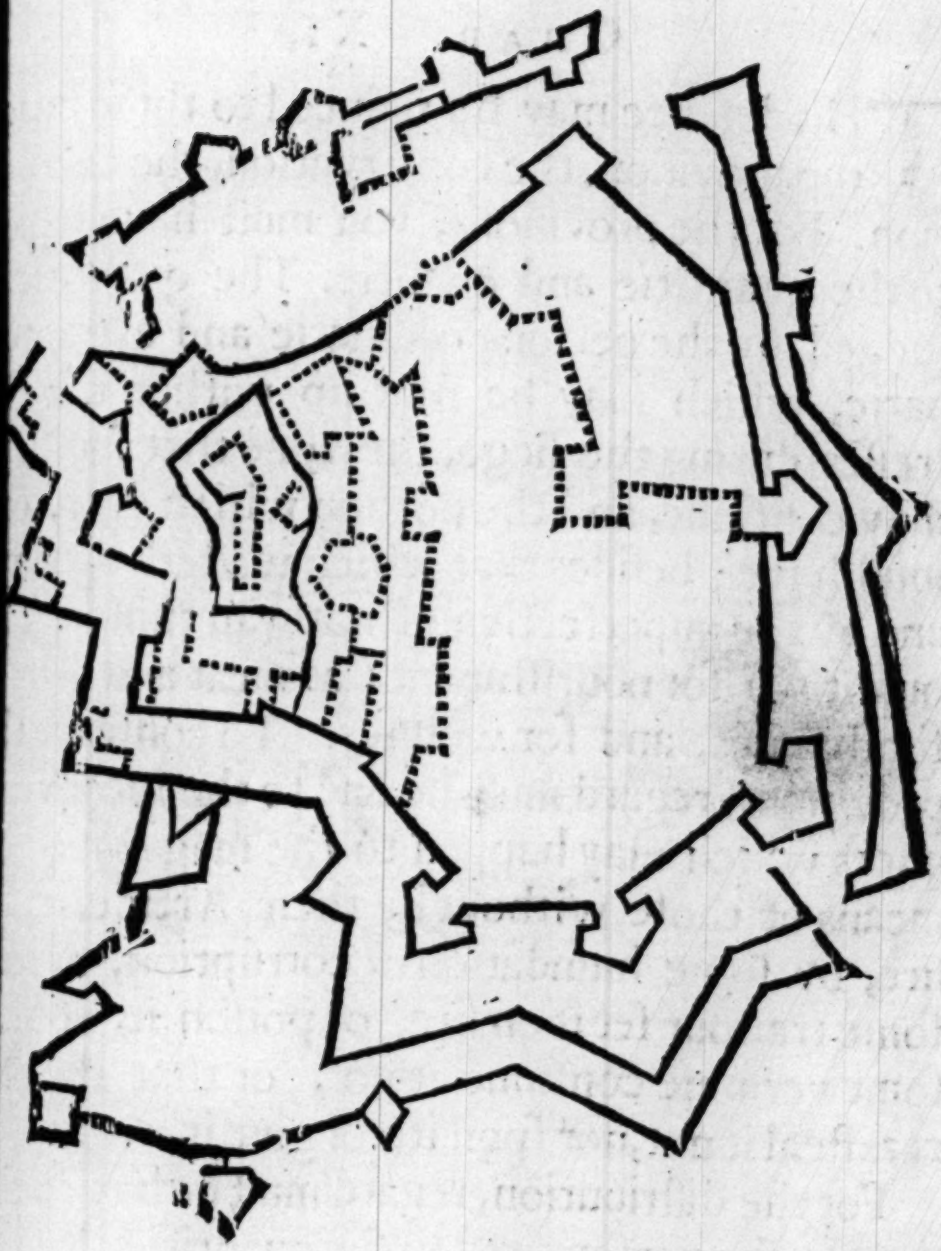
The breach being viewed, he will come to the ault, for which you muſt order your ſelf to give mbat and reſiſt him, either by handblows or re- nching your ſelf, or both; by handblows, ſo on as he ſhall begin to ſhew himſelf and be- me a mark for you, beginning to mount up to breach, repulſing him by armed men, which u ſhall have ſelected before the aſſault, being ſolute and hardy, which muſt headſtrongly thſtand the firſt furie; which will either cauſe enemie to retreat, or at leaſt you ſhall notably

miſchief

miſchief him. You are to make uſe of engine and inſtruments fitting to hinder the enemie fro climbing up to the breach, as calthrops ſtrewe upon the place, rowling leiſts, beſet with nai and ſquibbes, morters, ſtone-pieces, and engine to caſt granadoes, fireballs, cartouches, &c. Mine muſt not be forgotten, nor fire-works, as fire trunks, pots, moveable mines, fire-garlands, &c having carefull regard how, when, where, an from whence you caſt them, doing it to goo purpoſe.

If the enemie aſſault you by degrees, or th he make his batterie ſo leiſurely that he give yo time to retrench your ſelf, make your retrench ment well flanked and commodious, in ſuch ſo that by it you may reſiſt him. To effect this, ought to be difficult to be expugned, ſo flanke as it may be defended on the front and flank facile for ſallies, having before it a broad an deep moat with a counterſcarp and covert wa having the rampart ſtrengthened by palliſado which go along the outſide of the line, encl ſures of the camp, and gabions: And by th means you ſhall draw the buſineſſe to a gre length: for he muſt draw up his Artillerie upo the breach, after that he be lodged upon it, h muſt make a new batterie, a new overture, ne ſaps, mines, and chambers, which will give yo leiſure to make new retrenchments, and to ga and prolong the time, as the Hollanders did Oſtend, and in many other places.

The Plat of Oſtend, with the retrenchments. 1604.



The lines repreſent the fortreſſes of the town, and the pricks the retrenchments.

of

Of the defence of fortresses against famine.

Chap. XI.

THis defence may be reduced to three head the provision, the conservation, the distrib tion. For the provisions, you must have rega to the quantitie and qualitie. The quantitie judged by the persons ordinarie and extraord narie, which may be shut up within the fo tresses during the siege, the time that the sieg may continue, and the portion which every o must have; besides that which wasteth by tim and by the imperfection of naturall things. Th qualitie is for nourishment (as meat and drink for diseases, and for wounds. To conserve th provisions, regard must be had to the inconven ences which may happen to the magazines, b means of those without by their Artillerie, b fire, by some inundation or corruption, or lea some traitour set it on fire, or poison it, or tha some vermine consume it not, or that the off cers steal it not, nor spoil it, nor give it away.

For the distribution, regard must be had to th time, to the persons, and to the quantitie. To th time, when you should begin to open the public provisions, which is, when the private are con sumed, knowing the persons and munitions o every family. To the persons, who for the diffe rence of their condition must be diversly deal with, according to their estate and qualitie. To the quantitie, which must be measured by that which every day one person shall necessarily re quire for nourishment; having regard to their sex, age, exercise, and disposition.

Of

Of releeving places beſieged.

Chap. XII.

N the releeving of fortreſſes, you muſt conſider
he means to effect it, or to hinder it.
To effect it, either openly or ſecretly, having
ard to the place, to the enemies retrenchments,
to the releef.
To the ſituation of the place, which may be
mmodious and facile by reaſon of the open
mpains and freedome from impeachments;
diſcommodious and difficult, by reaſon of
gs, rivers, woods, and mountains.
To the enemies forts which are about it, as de-
ces by palliſadoes, gabions, moats, trenches, and
outs; who may either remain within his
nches, or go forth into the champain to beat
the releef.
For the releef, it muſt be guarded by a good
woy, becauſe otherwiſe the enemie might
rge and rout it, pillaging the munitions, hin-
ng the return, cutting off their way, being the
nger. You muſt know the means, the time, the
tagems, and the paſſages by which the releef
be conducted and introducted into the place,
rying with you ſufficient proviſion of things
eſſarie, for the victuall, for the armes, and for
hat concerneth the furtherance and execution
he releef, as pioners, boats, barks, and other
gines, to paſſe rivers and marſhes.
You muſt make good choice of the troop and
ſſe of ſouldiers which ſhould execute the re-
f, as, that the ſouldiers be well ſelected out of
ancienteſt, and that the officers be able and
ling courageouſlly to perform all that is to be
done,

donne, to execute the enterprise infallibly, or to r
treat honourably, or there to sell their lives a
dear rate.

A releef may be hindred, either by attendi
it within the trenches, or else by advancing t
wards them to give them battaile, and to oppo
their passage, abandoning the siege to go with
the forces, or with part of the Armie, leaving (
the mean time) the siege maintained, and t
trenches manned.

Of French Artillerie.

Of foundings, mixtures, and measures of ordinance.

Chap. XIII.

IN the founding of ordinance, to 100 pound
fine copper, you are to adde 20 pound
bell-metall; or for want of bell-metall, adde
pound of soft tin.

Or else, to 100 pound of copper, adde
pound of latin, and 8 pound of soft tin.

In the founding of ordinance, in regard of t
waste, in every 6 pound of metall you are to ad
1 pound over weight.

A singular care must be taken of the melti
and mixing of metals, for the inward neatnesse
the pieces To this end the material must
good, so must the earth for the moules; bei
well beaten aud through wrought with hair a
flocks. The moules, models and cilinders w
nointed and greased with good tallow, and boun
with hoops of iron, well and throughly neale
well placed and set. The trunions must be so ju

placed, as the piece may be as in ballance on
m, weighing almoſt equally forwards to her
zzel, as backwards towards her breech, that ſo
anonier may without trouble mount or im-
e her.

The piece muſt be ſtrong about the trunions,
thereabout ſhe ſuffereth the greateſt force, and
moving.

The touchhole muſt be of ſteel, that ſo the
ce be not made unuſefull ſo ſoon as if it were
metall, and muſt be cloſe to the breech.

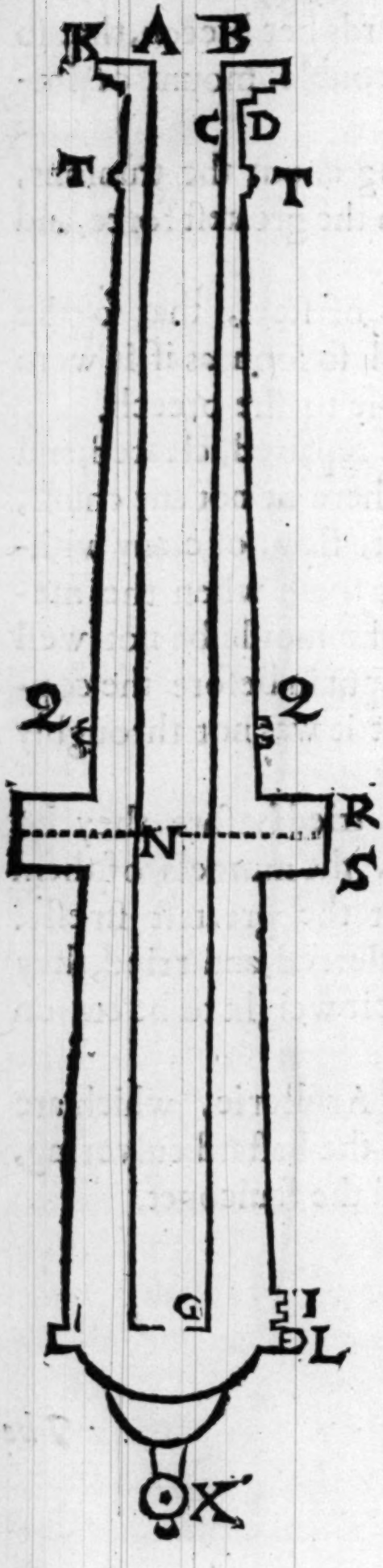
The pieces muſt be well repaired, cleared, and
d, having regard that there be not any chink,
e, hony-comb, crack, rift, flaw, or crany with-
hem; which uſually hapneth when the me-
is run too cold, or that the moule be not well
led, or that the tin was put in before the cop-
was well melted, or that it was not throughly
ed or incorporated.

The pieces ought to be tried before they be
unted on their carriages, the muzzels of them
unted, for ſo they bear the greateſt ſtreſſe.

hen they be ſo repaired, cleared, and tried, they
to be weighed, and their weight to be cut on
ir breech.

There be ſix calibres of Artillerie, which are
canon, the culvering, the baſtard culvering,
minion, the faulcon, and the faulconet.

The names of the parts of a canon.



A. B. The diameter
the muzzel, conca
or bore of the piece.
C. D. The neck.
G. I. The thickneſſe
the metall at
touch-hole or chamb
G. B. The length of
concave or cilinder
the piece.
R. S. The diameter
thickneſſe of the tr
nion.
K. The muzzel ring
freeſe.
N. A. The vacant ci
der from the charge
the guide of the ſhot.
N. X. The chamber.
L. The baſe ring, and
ſight upon it.
G. X. The breech.
X. The caſcabell or p
mell.
T. The aſtragall or co
nice ring.
Q. The reinforced ri
I The touch-hole.

Of weights.

The pound (mark weight) consisteth of two
rks, the mark of eight ounces, the ounce of
ht drams, the dram three penie weight, the
ie weight foure and twenty grains.

This weight cannot be

weight, for that hath but 20 penie weight in the ounce, and hath 24.

Of measure.

The fathom containeth 6 foot, the foot 12
nes, the inch 12. lines.

But the custome in England is

ivide the inch into eight equall parts, which I follow.

The measures of the parts of a canon, and the use thereof.

The diameter of the bore of the canon is six
nes and one sixt part of an inch.
The diameter of the bullet six inches.
The vent or aire for the bullet to play one sixt
.
The bullet weigheth 33 pound and one third
, which is called the Calibre of the canon.
The metall is two inches thick at the neck,
six at the breech.
The cilinder or concave is nine foot long, and
ally wide in each part of it.
The whole canon is somewhat longer then
foot.

Our English founding of ordinance differeth from the French proportions, as appeareth in Mr Nortons Gunner, page 53.

The diameter of the trunion is six inches.

The vacant cilinder or guide is five foot a an half.

The reinforced ring is distant from the mu zell ring foure foot and a half.

The thickneſſe or height of the muzzell ri is five inches.

The coronice ring is within half a foot of t muzzell ring.

The ſight of iron is placed on the flat b ring.

The metall of the piece weigheth abo 5600 pound.

Her carriage for the field is fourteen f long, and the axletree ſeven.

The canon mounted on her field carriag almoſt nineteen foot long.

The powder for her charge weigheth ei teen or twenty pound.

The ordinarie obſervation for all pieces That the charge of powder be at leaſt the m tie of the weight of the bullet, and ſo to third parts, which is rather better.

The canon may be laden ten times in houre, and 120 times a day.

She ſhoots point blank almoſt ſix hund [a] paces.

[a] Obſerve that paces are here underſtood to be onely ſteps: otherwiſe it were impoſſible.

Her platform muſt be fifteen foot broad, 20 foot long, for her reverſe. The formoſt foot are to be of plank, and the reſt of hurd if plank be wanting.

There muſt be twenty horſes to draw a non. A waggon drawn by foure horſes carrie thouſand or twelve hundred pound weight; about ten or twelve foot long in the body,

e waggon with the horſes about fifty foot;
d their breadth about the axletree is [b] ſix
ot.

One waggon carrieth three and thirty canon
llets.

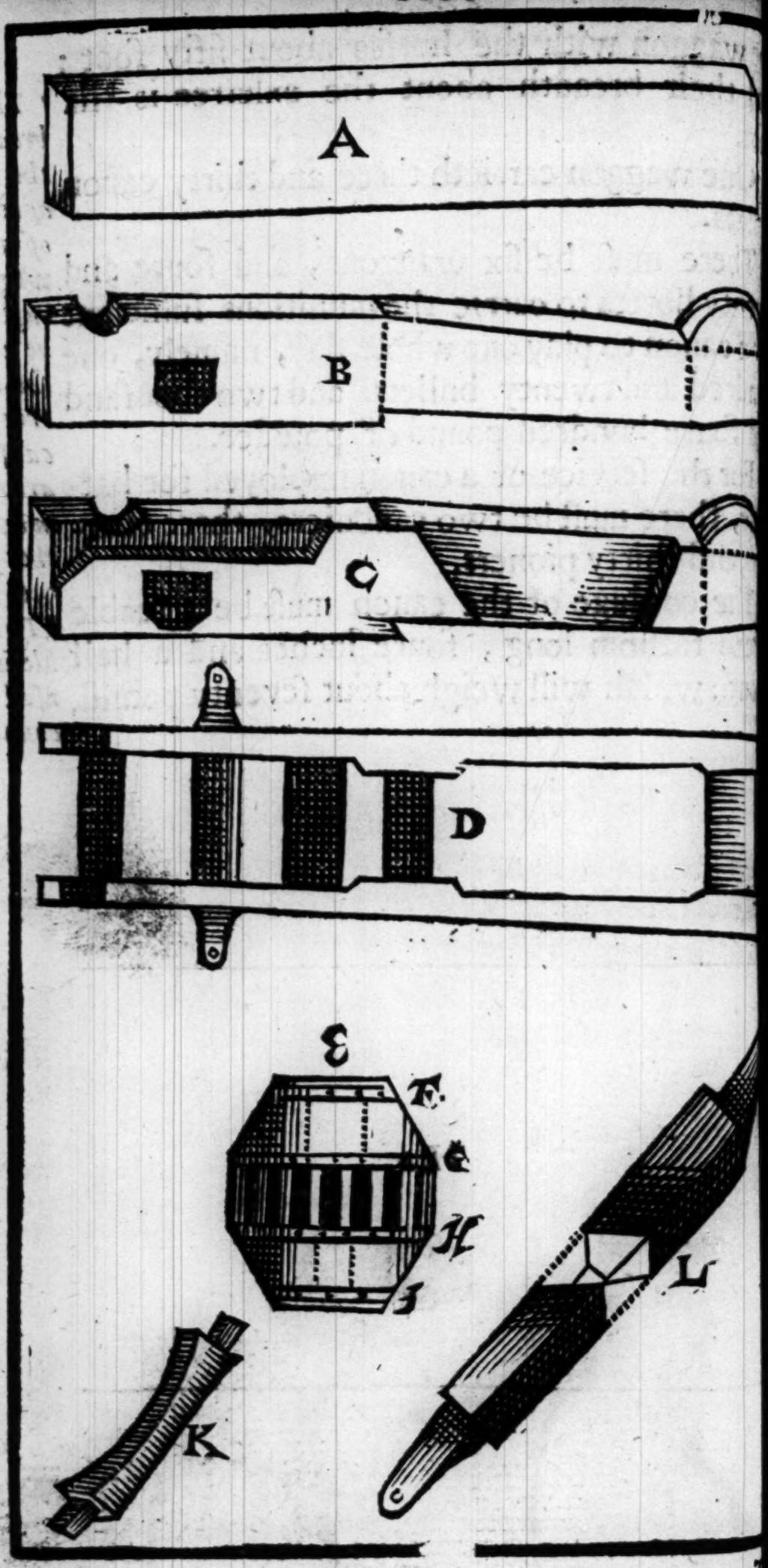
There muſt be ſix waggons, and foure and
enty horſes to carrie the munitions ſufficient
a canon to play one whole day, namely, one
ndred and twenty bullets, and two thouſand
d foure hundred pound of powder.

For the ſervice of a canon imployed for bat-
ie, there muſt be two canoniers, three char-
s, and thirty pioners.

The cordage of the canon muſt be a [c] cable
een fathom long, foure inches and a half
out: which will weigh about ſeventy pound.

[b] *The breadth of the carriages, and of the waggons ought to be alike at the axletree, becauſe they are to go in one and the ſame rut.*

[c] *This cable is not uſed in all countreys.*


A
B
C
D
E
F
G
H
I
K
L

The names of the parts of the carriages and wheels for the Artillerie.

A plank for the cheeks or side of the carriage 14 foot and an half long, one foot and an half thick, and one foot eight inches broad for the canon.

The outside of the cheek.

The inside of the cheek.

The carriage being [a] 13 inches broad within the work at the head, and 18 at the tail.

The axletree 7 foot long.

A spoke 14 inches long between nave and felloes, 4 inches and an half thick in diameter.

The nave of 20 inches long from E. to I. and as much in diameter over against G. in F. 17. and in I. 14.

G. H. I. Foure hoops of iron.

[a] Note that the canon, a little before, is said to be 6 inches thick of metall at her breech, and the

eter of her bore six inches and one sixt part: so then, the carriage t to be somewhat above 18 inches wide for the breech, bed and ; and so the tail must be so much the wider of course.

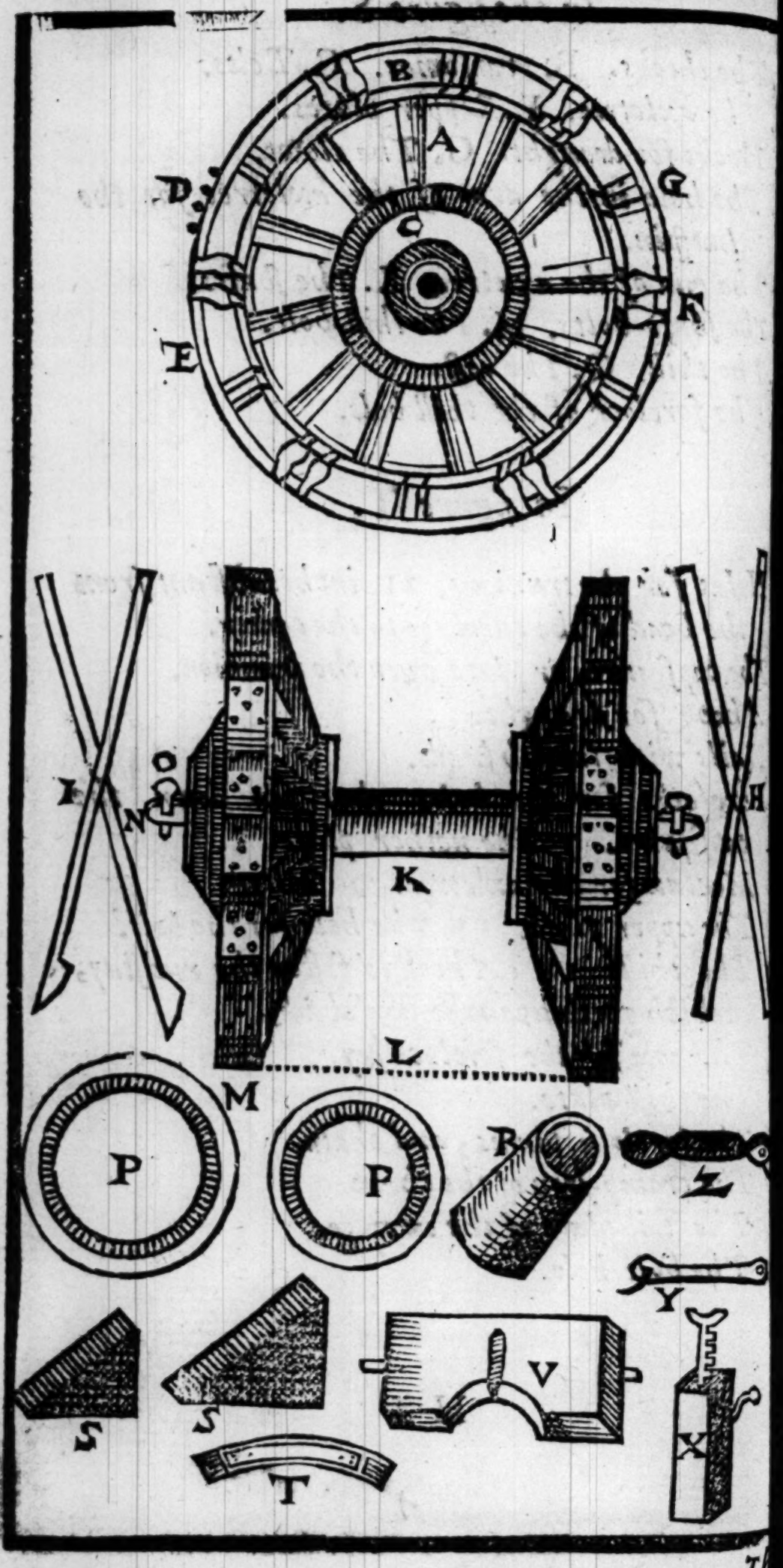
N
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In the figure S.

The cheeks. B. *Transomes.* C. *Bolts.*
The axletree. E. *Upper plates.*
Hooks for draught. G. *The clowt.*
The hole in the arm of the axletree for the lintspin.
The end of the axletree. K. *The shafts.*
The shaft-bolts. M. *The thill-bolt.*
The thill. Q. *The rest.*
The forelock of the thill bolt.

In *figure* T.

Holes for the trunions, 21 inches distant from the head of the carriage to the center.
The capsquire, or plate over the trunnion.
A hook for draught.
Nails with smooth heads.
Forelocks for the bolts that pin down the capsquire. 7 *The nether plate.*
Mortais for the axletree. 9 *Bolts.*
The upper plate. 11 *The hole for the bolt.*
The thill. 13 *A hook to fasten the rudstay, which goeth upon the horseback.*
The hole for the forelock key.
The thill plate.
The forelock, pinnes, and chain.
The cramp-iron of the chain.
The tail-plate of the carriage.
The bolt-hole.


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X
T

The wheels are five foot high being ſhod.

A. Spokes.
B. Felloes.
C. The nave.
D. Nails.
E. The plates for the ſhoing or tire of the wheels.
F. The barres over the felloes to ſtrengthen them.
G. The ſtirrops.
H. Leavers or handſpikes.
I. Crow leavers.
K. The axletree.
L. The diſtance between the wheels.
M. The rut of the wheel.
N. The end of the axletree.
O. The lintſpin.
P. The great and ſmall hoops.
Q. The boſſe of iron for the nave,
R. The great and little coins.
S. The dowledge of the wheel.
T. The ſight rule, to be placed upon the baſe-ring.
V. An handſcrue.
W. A bar, to be placed over the felloes.
X. A ſtirrop.

C
B
L
M
N
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D
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I

A. A canon mounted.
B. The cable.
C. The head of the ladle and ſpunge.
D. Thongs to tie the leavers, ladle, and ſpunge.
E. The ſtaffe of the ſpunge.
F. The ſtaff of the ladle.
G. The ſpunge.
H. } The ladle of braſſe.
I. }
K. The budge-barrell.
L. A caſque of corn-powder.
M. A caſque of fine powder.
N. A barrell of priming-powder.

of

Of the great culvering.

The diameter of her bore is foure inches and five sixt parts.

The diameter of her bullet, foure inches, and two third parts.

The bullet weigheth 15 pound and a quarter.

Her metall at her neck is one inch thick and three fourth parts, and at her chamber foure inches and five sixt parts.

Her cilinder is nine foot & foure inches long.

From the center of the trunions to the touch-hole is three foot ten inches.

The vent or aire for the bullet to play is one sixt part.

Her charge of powder is ten pound weight.

She shoots point blank [a] 800 paces.

She may be laden ten times in an houre, and 120 times in a day.

Her metall weighs about 4000 pound weight.

She requireth 17 horses to draw her.

A waggon carrieth 66 of her bullets.

She must have 120 bullets a day, and 1200 pound of powder; and for the carriage of her munitions for a day, three waggons and twelve horses, 24 pioners, two ordinarie canoniers, and two extraordinarie.

The cordage of a great culvering is a cable of twelve fathom long, and foure inches about weighing about 55 pound.

[a] *Understand paces as hath been observed before for the canon.*

Of the bastard culvering.

The diameter of her bore is three inches and three fourth parts.

The diameter of her bullet three inches and two third parts.

The

The vent or aire for the bullet to play one
velfth part.
The metall at her neck is one inch and one
urth part thick, and at her chamber three inches
d three fourth parts.
Her cilinder is eight foot ſeaven inches in length.
From the centre of her trunions to her touch-
le is three foot ſix inches.
Her bullet weighs ſeaven pound and a quarter,
d her powder five pound.
She ſhoots point blanck [b] 1000 paces.
She may be laden 140 times in a day, which is
out twelve bullets in an houre.
Her metall weigheth about 2500 pound.
She muſt have thirteen horſes to draw her.
A waggon carrieth 140 of her bullets.
Her munitions for her to play one whole day,
140 bullets, 700 pound of powder.
She muſt have two waggons and eight horſes
carrie her munitions for one day, twelve pio-
rs, and two canoniers.
The cordage of the baſtard culvering is a cable
[c] ſix fathom long, and three inches and an half
ck, weighing about 45 pound.

[b] *Obſerve as before.*

[c] *Here muſt be a miſtake:*

if the cable for the great culvering of 12 fathom long, and 4 inches
k, weigh but 55 pound, how can this, being but 6 fathom long,
3 inches and a half thick, weigh 45 pound? I conceive the miſ-
e to be in the length of the cable, which ſhould be longer, rather 9
n 6 fathom.

Of the minion.

The diameter of her bore is two inches and
ee fourth parts.
The diameter of her bullet is two inches and
o third parts.

The

The vent for the bullet to play is one twelfth part.

Her metall is one inch thick at her neck.

At her breech two inches and three fourth parts.

Her cilinder is eight foot long.

From the center of her trunions to her touch hole is three foot five inches.

Her bullet weighs three pound and an half and her charge of powder two pound and a half.

She ſhoots point blanck 1400 paces.

She ſhoots 160 bullets a day, which is about thirteen each houre.

Her metall weighs about 1350 pound.

She muſt have nine horſes to draw her.

A waggon carrieth 226 of her bullets.

She muſt have 160 bullets, and 400 pound powder for a dayes batterie.

One waggon carrieth her munitions for a day.

She is ſerved with ſix pioners, and two cannoniers.

Of the faulcon.

The faulcon may be laden fifteen times in houre, which is 180 times a day.

Her bullet weighs one pound and an half, the charge of her powder one pound, and her metall eight hundred pound.

She muſt have five horſes to draw her.

One waggon carrieth her munitions for two dayes.

She is ſerved with foure pioners, and one cannonier.

Of the faulconet.

The faulconet may be laden about 250 times day, which is about twenty times each houre.

Her bullet weigheth three quarters of a ound, and her charge of powder an half pound, r metall five hundred pound.

One waggon carrieth her munitions for 3 dayes.

One horse draweth her.

he is served with 4 pioners and one canonier.

a If the faulcon which igheth eight hundred pound, requireth five horses to draw her, the lconet weighing five hundred pound, will require three horses.

Of the harquebus a croc.

The harquebus a croc may be laden 300 times lay, which is 25 times each houre.

Her bullet weigheth 3 ounces, and her charge powder 2 ounces.

One waggon carrieth 14 hurdles of 10 foot g and 6 foot broad. It may carrie 12 dosen of es, which are usually about 18 foot long. It rieth 300 shovels, pickaxes, or spades.

These waggons are made with boards on the es and bottome, like tumbrels, to pack up those truments within them, and also many other aller ones, as sawes, chopping-hooks, hatch-, hammers, chizzels, crows of iron.

may carry 10 pieces of a bridge of bul-rushes. hese pieces are made after this manner, eve-piece hath 10 bundles of cane-reeds bound gether with cords as much as is possible, and en well sewed within a course cloath; so as ey become 10 sacks full of reeds; being a ot in diameter, and 6 foot in length. They are tned with good cords upon a hurdle of 10 ot long, and 6 foot broad.

How

How the Artillerie is to march.

Before the Artillerie do march, certain com
miſſaries, canoniers, the waggon maſter, and ce
tain pioners muſt go before to accommodate th
wayes.

The ſmall pieces muſt march before, then a
the greater ones, then three wagons; whereof th
firſt is to carrie a barrell of greaſe, and all th
ſmiths tools in a cheſt. The ſecond, all the whee
wrights and carpenters tools, the gins the leave
and handſcrue to raiſe the pieces. The third is
carrie the anvile, the bellows, and other ſmit
tools. Then follow the conductours and can
niers to guard them.

Then the waggons laden with bullets, powde
and other munitions.

All the canoniers muſt accompanie the ord
nance, every one near his own piece.

The Artillerie and munitions muſt be quarte
ed in a place ſufficiently ſpacious, which muſt
wayes have the front towards the enemie.

Round about the Artillerie and munitio
there muſt be a place large enough to cont
the guards.

Of the offices of militarie men.

Chap. XIIII.

Of the ſouldier.

He muſt be armed with ſuch armes as his captain ſhall appoint him; for he knoweth better then himſelf what armes are moſt fit for him.

He muſt ſhew himſelf deſirous to make manifeſtation of his courage, but muſt not therefore at ny time go out on any action without the expreſſe command of his chiefs, making it appear at he is diſcreet as well as valorous.

His eating and ſleeping muſt be regulated according to his leiſure, not according to his will.

He muſt not be a mutinier, neither muſt he ange his companie without great reaſon, nor part without leave obtained and authenticall rtificate of his faithfull ſervice. Good ſpirits not known but upon occaſions, which offer themſelves every day: beſides that, a private ldier which deſireth to attain to ſome place of mmand, hath need of a long time, to gain exrience ſufficient to render him worthie, and to ke his abilities known to ſuch as can advance n.

He muſt ſtudy to know the uſe and managing his armes, the duties of a ſouldier, the motions companies, his marching, his quartering in the ld, to make his guards, and place his ſentinels, to derſtand the beats of the drum, to make a ard for his ſuperiours.

The ſouldier ſhould not enroll himſelf under a ptain of mean reputation, or one that is cove-

tous, leſt he looſe his labour and time, to pre
vent changing. So alſo a Captain ought not to re
ceive a ſouldier without knowing him, leſt h
happen on ſome mutinier, coward, feeble or di
eaſed perſon.

Of the dutie of the Lanſpaſſadoes and Appointees.

They are to eaſe the Corporals, and to be
their Lieutenants and aides in time of danger
they are alſo rounders and ſentinell-perdues,
caſes of neceſſitie, but not otherwiſe.

Of the Corporall.

He hath the command of his ſquadron, and
to teach them whatſoever is neceſſarie for a ſou
dier to know and do. He is to lodge them by
meradoes, to prevent quarrels and diſorders
admoniſhing them, or acquainting the Capt
therewith; for to chaſtiſe them he hath
power, unleſſe it be by vexing them with ſtandi
ſentinell. He muſt have a liſt of his ſouldiers,
muſt give notice to his Sergeant when a ſouldi
name is croſſed out. He is to diſtribute the
ctuall, bullets, match, and powder to the ſoul
ers of his ſquadron; to know which are the m
experienced of them, that ſo they may be implo
ed in the watches and actions of greateſt impo
tance; to have an eye to their lives and manne
to take care of the baggage and money of ſuch
are hurt and ſick, cauſing every man to husba
his pay taken at muſters. Being on the guard,
muſt be vigilant and ſuſpicious; he muſt place t
ſentinels where the Sergeant major or his Capt
ſhall have directed him: he muſt releeve the
hi

himself, and must send a Lanspassado, or one whom his Captain shall appoint, whereof he is alwayes to have two, to visit them. He must attend his rounds and counter-rounds before his corps-du-guard, which must give him the word: and were it the Generall of the Armie himself, the sentinels ought not to suffer him nor any person to approach them, without charging their pike or presenting their musket, the match cocked; and if it be the grand-watch or other troop, stay them untill the Corporall come; who must never go alone out of his corps-du-guard, but with three or foure to accompanie him. He must advertise the sentinels how to demean themselves upon the discoverie of the enemie, either to give an alarm, or else to give notice without making any noise. The sentinels must never remove themselves, untill the Corporall releeve them, or that they be constrained by the enemie; and in such case they are to retreat to the corps-du-guard, as the corps-du-guard (being forced) are to retreat to the quarters, according to the Captains or Sergeant majors instruction.

He is to visit the souldiers entring the guard, to know whether they be sufficiently provided of powder, bullets, and match, viz. one pound of powder, two pound of bullets, and five fathom of match.

He must cause respect to be given to the corps-du-guard, and silence to be kept, whether it be about the gates or the walls, that so the noise may not hinder the hearing of the advertisements of the sentinels. He is to walk before the corps-du-guard, or to cause a Lanspassado

to do it. He muſt keep fire day and night, t
light the matches, and muſt take care to ſee th
corps-du-guard provided of wood, coals, an
candles.

Of the Sergeant of a companie.

He ought to be able to read, write, and ca
account, if it may be; to keep accounts of hi
ſouldiers, how many be pikes, and how man
muskets; the beſt armed and moſt courageou
of them he is to place in the firſt rank. It is h
dutie to cauſe the ſouldiers of his companie t
obſerve diſcipline both politick and militarie, a
all kindes of commands given by the ſuperiour
whereof he is to give them knowledge.

He is to inſtruct them in the managing
armes, in the keeping of rank and file, and th
in ſuch order as the Sergeant major ſhall appoin

He muſt take care of the armes and munition
to diſtribute the powder and match to the Co
porals, to place his corps-du-guards and ſentine
with his corporals, in ſuch places as his Capta
or Sergeant major ſhall have appointed; oft
viſiting them, to ſee whether they perform the
duties, imploying none thereunto but ſuch as a
capable, for otherwiſe an alarm might be oft
given without cauſe; he muſt make freque
rounds; and if he finde a ſentinell a ſleep in t
field, he is to commit him into the hands of j
ſtice.

When the companie marcheth, if a ſouldi
ſtep out of his rank, he is to compell him to h
place with the ſtaff of his halbert.

Whether he be in the field or in garriſon,
muſt take care there be no want of victuall, a

here be want, to demand it of the commiſſarie his deputies, then he is to diſtribute it to his rporals, and they to the ſouldiers.

He muſt every evening fetch the word at the geant majors lodging, and carrie it to his Cap-, Lieutenant, Enſigne, and Corporals.

He muſt order his companie both for their ching, embattailing, as alſo for their watch; for their encamping, that belongeth to the artermaſter.

He muſt place his guard at the houre appoint- and having ſhewed his Corporals the places the corps-du-guards and ſentinells, and there ed them, he is to give the word ſecretly to Corporals, according as he ſhall have received om the Sergeant major.

Of the Enſigne.

t is the Enſignes dutie to carrie his colours reſoever his Captain, or (in his abſence) the utenant ſhall command him, whether it be in ult or in battaile, having no regard to the dan- but to the means to attain it.

Entring the guard, lodging, in fight, or making , he is to bear his colours on his ſhoulder, anced; but when he marcheth in champain, may cauſe them to be born by one of the bra- ſouldiers, to which end he is alwayes to have of them near him.

The company marching in their order, the En- e is to be in the middle; but in aſſault, ſcala- or disbanded fights, he muſt be at the head.

In battaile the Sergeant major appointeth him place of march, and he ought rather to die n to quit or abandon his colours, for by loo-

ſing them, he diſhonoureth both himſelf and h
companie.

He muſt get the love of his ſouldiers, that
they may follow him with the better courage.

If the Colonell command him to plant his c
lours in the field, he is to do it; but he ought r
ther to acquaint his Captain therewith. And
caſe of alarm, without expecting any command,
muſt repair to the place of armes.

The place of armes of a Companie is befo
the Enſignes lodging, where all the ſouldie
muſt aſſemble in armes; and of a regiment, it
before the Colonels lodging.

Marching in battalia, he is to march courag
ouſly without bowing himſelf to any, unleſſe
be to his chief commanders, before whom he
to encline the head of the colours, more or leſ
according to their degree, without making a ſh
of raiſing his hand to his hat, or bowing his kn

Of the Lieutenant.

All the Lieutenants ought to be as able as t
Captains, whom they repreſent, ſeeing that
their abſence they have the ſame charge and a
thoritie: and oftimes the Captains are you
Gentlemen, deſcended from illuſtrious and va
rous perſons, which have courage ſufficient,
want ſtrength and skill He muſt keep the E
ſigne, drum, and all the officers and appo
tees near him, to make uſe of them as occaſ
ſhall ſerve

He muſt neither take on, caſhier, nor pun
any man in the preſence of his Captain, for at t
time he hath no authoritie, and all that he do

by permission and commission; but in his abnce he is to be obeyed as the Captain.

His companie being ordered for combat, if his aptain be absent, he is to lead them; but if he present, he must keep on the rear, and place s two Sergeants on the flanks, that so eveman may keep his rank, and fight resolutely.

At an assault he must assist the Ensigne, and lead m to the place of combat, which he must have ewed beforehand.

It is his charge to observe the actions of the orporals and Sergeants, to hold them to their ties, and to cause them to provide what is nessarie for the companie, and to assist them where shall see cause.

Of the Commissarie.

The office of a Commissarie of souldiers is to use the musters to be taken and moneys to be yd, to receive the oath, and to give the quarters r the lodgings.

Of the Captain.

A Captain ought to be expert, diligent, and cougeous; he must know the duties of all that are nder him, but principally his own.

His office is to lead his companie whersoever s Generall or Colonell shall command him.

His functions are, to give the orders to his ieutenant and Sergeants for the marching of his mpanie, be it three or five in rank, placing his uskets in the front and rear, and the pikes in the iddle. Or in battaillon, placing the muskets on e flanks of the pikes.

He must teach them how to fight, be it in su
prise of an embuscado, in approach of cities, in a
saults, encounters, skirmishes, or battailes. To lea
them on prudently, labouring to bring them o
with as much glorie, as he shall have courageou
ly brought them on.

The Captain must alwayes be at the head
his companie, certain paces advanced before them
unlesse it be to joyn in battaile, for his sole perso
were not able to sustain the shock of the enemi
pikes, but then he is to place himself in the fir
rank of his companie.

He must cause his souldiers to be taught th
use of their swords, pikes and muskets, teachin
them how to order themselves in battalia, and
rally themselves being disbanded, either by occa
sion of an *alto*, a narrow way, or a defeat. Also
make their huts, and all other exercises of warre

At every dislodging he must cause his compan
to be put into battalia, and then to cause them
march according as the ground will permit, and
their lodging to lead them in a long order
march, either 3 or 5 in rank.

Marching with his companie alone, he canno
punish a souldier with death, unlesse he rebell, fo
then he ought to kill him, but for any other ma
ter he can but disarm him, take away his accoutre
ments of liverie, degrade and cashier him;
commit him to the censure of the Colonell
that regiment.

He must take care for the payment of his sou
diers, of their armes, victuall, and munitions,
cause the hurt to be healed, and to compo
quarrels. He must make choice of an expe
Lieutenant, a courageous Ensigne, two diligen

Sergeants

rgeants, ſuſpecting Corporals, a faithfull clerk, carefull harbinger, a bold chirurgeon, and a ous Chaplain.

The Captain appointeth his own Sergeants, rbinger, drum, fyfe, and chirurgeon: but for his eutenant, Enſigne, Corporals, and Appointees, muſt preſent them to his Colonell, and to have s leave to place them in their offices.

The companie entring the guard, the Captain to march at the head, with a pike in his hand, d compleatly armed. If it be in the field, they e to be ruſſet, but rich ones; if it be in a citie, ving a fair plume on his head-piece, which he all cauſe to be carried before him.

He muſt cauſe his ſouldiers to know how to ht ſingle, how in a body.

He muſt know the advantages of places, armes, mes and occaſions, and how to make uſe of em.

To underſtand fortifications, the manner of de- nding and aſſailing of places of ſtrength; how, d in what manner the works are to be made; at ſo when it ſhall come to his turn to direct or ard a work, he ſhew not himſelf a novice or eſh water ſouldier.

Of the drum.

In every companie there muſt be one or two ums, and over them all a drum major.

The dutie of every drum is to beat all manner beats, as the march, the alarm, the troop, the amadoes and anſwers thereunto, reveills, and oclamations.

They muſt know how to obſerve what they e, to take good notice thereof, and to make true port of it.

The

The drum major muſt be lodged near the Ser
geant major, or in his own lodgings; it being hi
part to give inſtructions to the reſt, and to obſerv
and take into his cuſtodie the enemies drum
which enter the camp.

He may with his ſtaff correct the drums whic
fail of their duties.

All the drums are to attend him morning an
evening to the Sergeant major, to know the o
ders.

Of the harbinger.

He muſt have a liſt of the ſouldiers of his com
panie, and make the diviſions for the lodgings.

At the muſter he giveth a muſter roll of th
ſouldiers to the commiſſarie, controller, or clerk
and keeps account of the payes received and du
alſo of the armes of the companie belonging t
his Captain.

He is to take his quarter from the Quarterma
ſter, then to mark out the Captains lodging, th
Lieutenants, Enſignes, Sergeants, his own, th
drums and fyfes, and to put the reſt into bille
or lots, and to cauſe the Corporalls to draw the
by turn, who ſhall diſtribute them among the ſou
diers: this is to be done before the Enſigne
lodging. He ought to keep a regiſter of all th
lodgings of his quarter.

Of the barber chirurgeon.

In every companie there muſt be a chirurgeon
to trim the ſouldiers, to attend them which ar
ſick, to dreſſe the wounds of ſuch as are hurt (be
ing as an aſſiſtant to the chirurgeon of the regi
ment) having proper remedies to ſtench th
blou

loud, to hinder inflammations, and to asswage the ain.

Of the Provost.

It is the Provosts charge to pursue fugitives, to pprehend delinquents, and to imprison them.

He hath under him a Lieutenant, a clerk, six larshals, and an executioner. His Lieutenant ust be skilled in the lawes; if he be not, he is to rocure some graduate in the lawes to assist him.

He sets the prises on all the victuall of his quar-r, and no man can sell any unlesse it be taxed by im. He appointeth the butchers shambles, and to take care that the quarters be kept clean. He aketh out processes, heareth and examineth wit-esses, searcheth out the truth, &c. And having fit-d the cause for triall, the Colonell, Sergeant ma-or, and Captains judge of it, and passe sentence in he name of the Generall.

Before a souldier be delivered to the execu-oner to be punished for any infamous delict, he ust be publikely disarmed and degraded by the ergeant major.

In marching, it is his charge to conduct the aggage, and to see it kept in good order.

Of the Quartermaster of a regiment.

The office of the Quartermaster is to quarter he regiment, and to distribute the quarters to the arbingers of each companie.

He must ordinarily be near the Colonell, and ust every evening go to the Quartermaster Ge-erall to receive the orders for the divisions and he rendez-vous of the troops, and to give know-edge thereof to his Colonell.

When

When the Marſhall of the field removeth, the Quartermaſter Generall, and all the Quartermaſters of the regiments, with all the harbingers of companies are to accompanie him.

The diſtributions of lodgings being made by the Marſhall of the field, his aſſiſtants, and Quartermaſters Generall, and delivered to the Quartermaſters of regiments, they are preſently to adverteſe their Colonels of the place, and to conduct them thereunto, either by themſelves or ſome others.

During the time that the Quartermaſter is about viſiting the diſtributions of the lodgings, all the troops are to keep watch round about the place, and to ſend out to diſcover.

Firſt he appointeth the Colonels lodging and the Sergeant majors, then his own, in the middle of the regiment if it may be, then he makes as many quarters as there be enſignes, and the harbingers of every companie chooſe the beſt lodgings for the Captains, Lieutenants, and Enſignes.

The Quartermaſters of regiments muſt cauſe the harbingers to draw the billets for their quarters every one in his order.

They muſt be informed of the lodgings of the whole Armie, to know to whom to give or from whom to receive ſupplies in caſe of neceſſitie.

If the quarter be in the open field, the Quartermaſter Generall ſhall appoint to each Quartermaſter the place and ground which he ſhall take, and the Quartermaſter ſhall diſpart the ground to the harbingers.

Of the Sergeant major.

His office gives him acceſſe to the Generall of the Armie at all houres, who ſpeaking with him

know

nows from him when, where, and how his regi-
ent ſhall march, whether alone or with others;
hether in one battaillon or many, and in what
rm.

It is his office to give order how the compa-
es ſhall march, ſo that his place gives him au-
oritie and command over all the Captains of his
giment.

He muſt be exceeding well experienced and
ercíſed in his office, principally in embattailing
s men; and to rally them being routed, and that
ſuch form as he ſhall be commanded.

He muſt know of the Generall whether his
giment ſhall march in the vanguard, battaile, or
ar.

He is to know the countrey, whether it be
ge or ſtrait, and thereby to judge how he is to
rch, and what order to obſerve, that he may
t be diſturbed by the horſe, artillerie, nor bag-
ge: being ready to march away, he ſhall cauſe
e drum major to beat, and he the reſt.

He muſt advertiſe the Captains, cauſe the En-
nes to march out of their quarters, form his bat-
llon, and give to every Captain the place which
ſhall hold for that day.

Having brought his troops into the field, he
uſt ſee them march away, and obſerve whether
ey march in good order. The Colonell is to
d at the head of the regiment.

Then the Sergeant major is to go to the Ge-
rall, and to keep near him as much as may be
ring the march, to ſee whether there will be
y new order for him to receive.

If there be any difficult paſſage, the Sergeant
jor ought to be there preſent, to prevent the
diſosder

diſorder which might happen in his regimen
and to put them in order again if they were di
ordered. Before the regiment enter their qua
ters, the Sergeant major ought to go and take
view of them, or cauſe them to be viewed; the
at his return to the regiment, to give licence
the Enſignes to lodge, except thoſe whoſe tu
it is to have the guard, which muſt enter th
corps-du-guard, and place their ſentinels, unt
it come to the turn of others.

Now the regiment is to be lodged either
the field or under ſhelter. If it lodge in t
field, either the regiment is alone, or accomp
nied with others. If it be alone, the Sergea
major muſt cauſe it to be barricadoed, or
trenched, or encloſed by waggons, or other d
fences of the field.

After that he is to place his corps-du-guar
round about the quarters; and the ſentinels
ſo near a diſtance that they may hear each oth
ſpeak, being about eighty or an hundred pac
off from the corps-du-guard: they are to be do
ble, that is, of two men, namely, a musket and
pike; and 500 paces from them, other ſing
ſentinels are to be placed, which are called pe
dues. In caſe of alarm, the ſentinell-perdue ſha
retreat to the double ſentinell; and in caſe of n
ceſſitie altogether (having given fire) are to r
treat to the corps-du-guard.

The Sergeant major muſt often, and at dive
houres of the night, viſit the corps-du-guards.

If there be more regiments, they ſhall fortif
themſelves with waggons, or entrench them
ſelves, and each regiment ſhall take their qua
ter, and ſhall make their guard as aboveſaid.

If an alarm be given in the field, the Sergeant ajor is to betake himſelf to the alarm-place of e regiment, and there to form his battaillon, d ſend men to double the guards on that part here the alarm was given, and to give notice his Colonell and the Generall of foot (if he be eſent) of what paſſeth. The Enſignes muſt not treat, unleſſe the Generall, or their Colonell, Sergeant major give them leave.

No Enſigne muſt remove from his place, nor ter into the ſame, without leave of the Serge- t major or his aſſiſtant. No order ought at y time to be altered but by him, for he giveth t any orders but by appointment of the Ge- rall or Colonell.

All ſorts of munitions which are to be diſtri- ted amongſt the regiment, ought to be deli- red to the Sergeant major, who is to divide em amongſt the companies. He hath the arge to provide all things neceſſarie for his re- ment, to ſend away the ſick men to hoſpitals, mmanding the Provoſt to provide waggons.

The Captains are to receive the adviſes of the rgeant majors aſſiſtant, as from himſelf; the uartermaſters do uſually perform this office.

The Sergeant major ought to take the word om the Generall, or the Marſhall of the field, from his Colonell; In abſence of theſe he veth it himſelf.

In the day of battaile he ought not to be on ot amongſt the Captains, but muſt be on horſe- ck, now on the front, then on the rear, to put order thoſe which might happen to be diſor- red.

If the regiment lodge under ſhelter, the Ser-

geant

geant major is to view the place within a
without, the moats, the gates, and the walls, a
pointing the places for the corps-du-gua
and ſentinels, and the way of the rounders, th
it may be free.

He muſt chooſe a place to make the alar
place for the regiment, and there the comp
nies are to have their rendez-vous, in caſe
alarm.

After that, he muſt lead his regiment in ord
into the alarm-place, placing his guards at t
gates, and on the walls; that done, he ſhall gi
leave to the Captains to go to their lodgings
their ſeverall quarters in the town, giving the
order (under his hand) concerning the pla
whither they ſhall reſort in caſe of alarm
which order he may change ſo often as he ſh
think good; for the companies ought never
be aſſured of the place of their ſtation, unleſſe
be for the rendez-vous within the town, but n
for the quarter on the walls: for the Sergea
major muſt (at every turn) cauſe the compan
to caſt lots, to know what part of the walls w
fall to their turns.

He ought to take care to cauſe the bridg
corps-du-guards and watch-houſes to be repa
ed, if need be, and to have wood, torches, la
terns, and creſſet-lights for the guards.

He is to cauſe the companies to enter t
guards about ten or eleven a clock in the mor
ing. He is to open and ſhut the town gates at t
riſing and ſetting of the ſunne; and to place t
watches for the walles preſently upon ſhutti
the gates, and to releeve them at the opening
them.

The Serg ants which have the guard muſt be reſent at the opening and ſhutting of the gates, nd carrie the keyes of the gates to the Sergeant ajor, and he to the Governour; but it is better at the Sergeant major be there aſſiſting, and preſent at the placing of the guards, ſo often may be.

He muſt have a liſt of all the ſouldiers of eve- companie as they paſſed at the muſter, ſigned the Commiſſarie or Treaſurer which took the uſter; and in caſe he finde not ſo many ſoul- ers at his guard, the officers of the companies to give him an account thereof, becauſe it be- ngeth to him to give account to the Generall ncerning his regiment.

Of the Sergeant major Generall.

The Sergeant major Generall receiveth from Generall a plat of the form which he will ve to his Armie, the diſpoſition and placing of members of it, Cavallrie, Infanterie, Artille- ; the order which they ſhould obſerve in ht, with commiſſion ſigned by the Generall to poſe it in that manner.

To this commiſſion the whole Armie muſt ld obedience, and the Sergeant major Gene- l with the Marſhals of the field ſhall diſpoſe reof, according to the form and place which Generall ſhall have prefcribed.

Of the Quartermaſter Generall.

He hath the ſame charge of the whole Army, ich the Quartermaſter of a regiment hath of regiment.

Of the Colonell.

The Colonell ought to be a man of authority

and reſpect, to have abſolute command over hi
Captains, from which he muſt procure love an
reverence, which he is to gain by his valour an
modeſtie.

The regiments being together, muſt marc
according as the King hath given them preh
minence, and in that place which the Genera
ſhall appoint them, in the van, battaile, or rear.

His principall charge is to lead his regimen
to the combat, on the head thereof.

He ought to viſit his troops, cauſe his guar
to be well ordered, changed, and releeved, a
to ſee that each officer do his duty, and that t
works be well ordered.

He ought to ſee how his Companies be fu
niſhed, what armes they have, and what exer
ſes they perform, and to command the offic
what they ought to do.

In the armie the Colonell cannot give lea
to a ſouldier to depart from his regiment, but
change his Companie; the firſt appertaini
onely to the Generall.

The Colonell ought to be called to counc
by the Generall, when matters are to be agi
ted which belong to his charge; where he ſh
heare the opinion of others, and freely ſp
his own. And if it be about a matter of i
portance, and that he knoweth his opinion
be good, though the contrarie opinions (be
ſtronger in number) do carrie it, he ought
commit his opinion to writing, to pu
himſelf before his Soveraigne, in caſe the e
cution of the councell prove ill. Mean ti
he muſt give way to the pluralitie of voices, a
entirely obey his Generall, and appear in

pla

laces where he ſhall be commanded, making it ppear that the contrarie opinion which he ld at the councell was not for want either of urage, or of good affection.

The Colonell muſt render all manner of obe- ence to the Generall of the armie, and to the enerall of Infanterie, (for they have power to mmand him) and to the Marſhall of the field, having the charge from the Generall to give e orders, the quarter, the alarm-place, the field the battaile; to cauſe the forces to march, dge, diſlodge, enter into guard, convoy, &c.

The aſſiſtants to the Marſhall of the field, or e Sergeant major Generall cannot command any thing as of themſelves, but by order ned by the Generall, or the Marſhall of the ld for the armie, with the plats and deſignes of ground of the ſtations and places for combat, ing command by vertue thereof.

Of the Marſhall of the field.

He ought to be valorous, judicious, and ex- t, to remedy many caſuall accidents.

He ought to come firſt to the rendez-vous of armie, to receive his troops there, to diſpoſe the diſparting of the lodgings, as well for the vallrie and Infanterie, as for the Artillerie, ſuall, and pioners.

He is to inform the Generall of the whole ate of the field, and then the Generall will e him the order and diſpoſition of his armie, ereof he is to give notice to all the comman- s of horſe and foot, ſending them the dire- on.

He is to ſet down the order of the guards of field, and of the convoyes, and to cauſe the

laws and ordinances to be publiſhed and o
ſerved.

He is to view the paſſages by which the A
mie is to march, to know what order they mu
obſerve. To do this, he is to take three or fou
troops of light horſemen, of ſuch as are to ha
the guard the night following, which are war
ed over night to be in readineſſe againſt t
morning following, and to be at the rendez-vo
which ſhall be appointed them, rangeing the
ſelves under the cornet of the ſaid Marſhall
the field with the Quartermaſters, Commiſ
ries of the victuall and artillerie, engineers, ha
bingers, and pioners.

In marching he is to ſend a troop before, a
one on either hand, who ſhall ſend out befo
them five or ſix ſcouts to diſcover the champa
as perdues.

If an alarm happen, he ought to be well
formed of the cauſe, and not to miſtake it;
ought he not to ſtay ſo long that he be put
flight, but ſhall ſend word to the Generall
ſupplies, that ſo the Armie may have leiſure
embattaile.

If he arrive ſafely at the rendez-vous of
Armie, he is to ſend his troops half a mile
more beyond, to diſcover the countrey, and
get intelligence concerning the enemie; m
while he is to obſerve the ground and place
the camp, and having traced it out in the ge
rall, the Quartermaſter Generall ſhall make
diviſions, and deliver them to the Quarter
ſters of regiments.

Finally the Marſhals of the field ought to
der the quartering of the whole Armie; to

e first on horseback, and to alight last, being al-
ayes present at all the motions of the Armie.
He must take the word from the Lieutenant
nerall of the Armie, to give it to all the offi-
s of the field, which must come to him for it.
The Generall and Lieutenant Generall of
se, the Generall of foot, and the Generall of
Artillerie take the word from the Generall
he Armie, if they will not take it from the
rshall of the field.

Of the Commissarie Generall of the victuall.

The Commissarie Generall of the victuall
ght to know the number of men which are to
fed, the place whither the munitions are to
brought, when they must begin to be distri-
ed, and how long to continue, that so he may
ke provision of corn, and cause the bread to
baked.

The measure of wheat at Paris is this, the
yd hath twelve septiers, the septier twelve
sseaux. The septier of wheat weigheth about
pound, and of meslin 220 pound.

what these make of our English measures, see it in Cotgrave, and others.

The munition meslin is two third parts of
eat, and one third part of rye: the boysseaux
his meslin weigheth about eighteen pound.
re is drawn out of it three pound of bran, and
en pound of meal, which is kneaded with
pound of water, whereof the paste weigheth
ound, of 16 ounces in the pound, and makes
ut 20 pound of baked bread.

o every souldier is usually given two loaves a
of ten ounces weight a piece, and one pinte
vine Paris measure, such as there is 290 in a

muyd, and three muyds make a tun.

The Cavallrie is not fed with amunitio bread, becauſe they are uſually quartered und ſhelter in towns and villages. The waggons carrie munition-bread are made after the ma ner of tumbrels or cheſts, each of them is drav by foure horſes, and carrieth 1500 loaves, an mule with wicker paniers carrieth 300.

There muſt be three times as much carria as is needfull to carrie victuall for one day; as feed five thouſand mouths, there muſt be thouſand loaves, and five and thirty mules horſes to carrie them; being tripled they be one hundred & five mules, which muſt be h namely, one third part to go to fetch the bre one third part which is coming with it, and third part which is unlading. There uſeth or narily to be added to the munitions one quar of bread and wine more then needeth.

Of the Maſter or Generall of the Artillerie.

He is abſolute over all the Artillerie and officers thereof, and is ſubject to none but King, and in the armie to the Lieutenant Ge rall.

He muſt keep account or inventorie of pieces, powder, bullets, and equipage of pieces, and of all the officers of the Artillerie the whole kingdome, to inform his Maje when he ſhall have a deſire to execute ſome ſigne, as to beſiege ſome place, to fight a b taile in the field, or at ſea, or to ſtrengthen holds.

He ought to know what proviſions and p

parati

rations he is to make, how and where the or-
nance are to be planted, at what distance they
ould be levelled, of what qualitie the wall is
hich is to be battered, and what the power is
his Artillerie.

If a souldier of the armie hath committed
y offence, and can convey himself among the
tillerie, he is there as in a priviledged place,
d cannot there be apprehended, unlesse it be
the Provost of the Artillerie, who shall deli-
r him into the hands of his Captain, after
at he be informed of his delict by a legall
all.

In the situation of the ordinance he is to re-
rd that the place be commodious, that it be
ie to be defended by the souldiers, that they
ay skirmish with facilitie, that in case of ne-
ssitie the ordinance may speedily retreat, that
ey may discover, command, and batter point
ank, and that their distance be not excessive.

The souldiers appointed to guard the Artille-
, ought not to come nearer it then fifty
ces.

The Generall of the Artillerie ought every
are to present a list of the officers of the Artil-
ie to the King, filling the vacant places with
e names of such persons as he shall think most
ting; then the King either confirmeth the
me, or altereth it at his pleasure, then signeth
and causeth it also to be signed by a secretarie
state. This list is delivered to the treasurer
enerall of the Artillerie, who prosecutes the
signations, and payeth the officers named in
at list, taking their acquittances.

His officers are, a Lieutenant Generall, a

Guard Generall, two Controllers Generall, Treasurer Generall (who payeth according the Generall of the Artillerie his order) a Quartermaster, a Provost; and each of them hath two Commissaries in all the storehouses and armories of France.

He causeth the ordinance to be founded, tryed, and mounted, he buyeth the metall, wood bullets, iron work, pikes, muskets, and all sorts of armes, shovels, pickaxes, hatchets, hammers, ladders, &c. horses, waggons, cordage, &c. causeth the powders and fireworks to be compounded and that in all the magazines of France.

Of the Generall of horse.

He commandeth all the light horse and carabines, and in his absence the Colonell doth it.

He lodgeth and leads them, and sends them to the conflict, and gives them the order of combat.

He is lodged with his Cavallrie at the head of the Armie, sends out every day to discover the enemie, renders an account dayly of the same and their actions to the Lieutenant Generall of the Armie.

The chiefs of the forces are the King, the Kings sonnes, the Princes of the bloud, the Generall, and the Colonells, &c.

For all the troops there is a Quartermaster, and one or two harbingers Generall.

And over every troop, a Captain, a Lieutenant, a Cornet, a Quartermaster, an harbinger and a trumpet.

The dutie of the troops is, alwayes to scour and discover the high-wayes and advenues by which the enemie might come, and to be ever hoverin

overing about the enemies Armie; for this ause they are to make great and long dayes-ournevs, but are excuſed of watch in the night, xcept in their own quarters, and for them onely.

At the ſiege of towns they are ſent before to ake waſte, to ſeize on the paſſages, to inveſt e towns, to skirmiſh, and to take priſoners, ereby to be informed of the eſtate of the own.

It is no diſgrace for the light horſe to retreat the gallop, for their dutie is to fight as well reating as advancing, ten againſt fifty, thirty gainſt an hundred; therefore they muſt be well ractiſed to make a good retreat, and to ſingle emſelves out of a greater troop then their wn, and to charge them again in opportune me, according as their courage and judgement all give them reſolution, and experience ſhall rect them.

Of cuiraſſiers.

The Conſtable or Generall of the armie com-andeth the cuiraſſiers, and in his abſence the eutenant Generall of the armie.

They are divided into troops of an hundred en, at leaſt thoſe which belong to the King, the inces, the Conſtables and Marſhals of France; e reſt are not ſo ſtrong.

The officers of every troop are a Captaine, a eutenant, (in the Princes troops there be Sub-utenants) a Cornet (which is ſquare for the iraſſiers) or a Guidon (which is long and ſplit the harquebuſiers) a Quartermaſter, a harbin-r, and a trumpet.

They may fitly march, lodge, or fight in the van,

van, battaile, or rear, according to the ord prescribed by the Constable or Generall of th armie.

The Captains choose and dispose of plac amongst all their members at their pleasure, bu they cannot cashier any unlesse he hath bee wanting in the Kings service.

Their dutie is to keep close united, to marc soft and fair, and never to turn their back and for this reason they must be heav armed.

Of the Generall of Infanterie.

The charge of the Generall of the Infanter extendeth it self over all the foot, much more a solutely then the Colonels of his regiment.

In all the regiments he maketh the Sergea Majors, Provosts, Quartermasters, Chirurgeon and Almoners.

All administrations of justice over all the foo passe in his name.

He hath the nomination and presenting the Captains to the King, he is also to give hi information of the sufficiencie or insufficienc of the Colonels, seeing that the King bestowe their offices upon them, that so he may kno all those of his kingdome which are capable, having learned their profession amongst th foot.

Of the Constable or Generall of the Armie.

He hath the command of the whole armie.

He ought to know all the duties and charg of the officers thereof, and should be of gre experienc

xperience, that ſo amongſt many differing opi-
ions, which are uſually in councels, he may be
ble to chooſe the beſt.

He ought to be of great authoritie in his
ommands, of great courage in combats, con-
ant and reſolute in croſſe accidents, ſuc-
eſſefull in his enterpriſes; and that he may
e ſuch, he ought to invoke God to be propiti-
us to him, who will give him judgement to diſ-
poſe his armie after the beſt manner, and (by his
ood diſcipline, diſpoſition, and order) to render
t not onely able to overcome (which is all that
Generall can do) but will alſo make it victori-
us, if it depend on the power and favour of the
Lord of hoſts.

Good ſucceſſes or bad ſhould not make him
hange countenance, but to receive both mo-
eſtly, without diſcovering the paſſions of his
oul by his countenance.

Impatience, ſluggiſhneſſe, choler, cruel-
ie, or envie towards thoſe which acquire
lorie under him, ſhould not be harboured in his
oul.

He muſt be reſolute, and well weigh the
ccaſion of giving battaile, rather then hazard
ll his troops in fight; labouring to over-
ome his enemie as much by induſtrie as by
orce: as, in ſurpriſing him being diſordered,
is troops being ſcattered, wearie, wet,
r ſurpriſed with hunger, thirſt, cold, or
ome other accident.

He is not to ſuffer skirmiſhes, unleſſe he ſee
much advantage; for by overcoming in theſe
mall occaſions, the ſouldier becomes more cou-
ageous, aſſures himſelf of the good fortune and

good

good leading of his commanders, and easily per
swades himself of the victorie.

He ought to consult with many, but never t
tell his resolution to any man, or at least to ver
few : by this means he shall render himself s
practised as he shall be able wisely to lay hol
on fit opportunities and the instant of occasions
to prevail thereby.

He ought to acquire the love of all men, prin
cipally of the commanders, and not to weari
or tire his army too much, for fear of diseases, ye
to cause his battaillons to be throughly exercise
in all exercises of warre. He ought to be rigorou
towards evil men, and to cause justice to be rea
dily executed.

Of fireworks.

CHAP. XV.

IN the tenth chapter hath been shewed wha
materials were to be provided for fireworks
here shall be taught how they are to be com
pounded.

To make garlands or pitcht ropes for cressets.

Take of black pitch twelve pound, of tallow
six pound, linseed oyle six pound, hard resin si
pound, turpentine six pound, melt these altoge
ther, and lay match therein, untill it suck up al
the composition and be well incorporated; then
make your garlands therewith.

To make torches againſt rain and winde.

Take cords of fine hemp, very open twiſted, bout the thickneſſe of ones little finger, beat em with a mallet till they be very ſoft; diſ-lve ſaltpeter, and boil the ſaid cords therein, en let them be dried. Make a paſte of ſulphure d gunpowder beaten together, ſoaked in lin-ed oyle untill it be liquid; ſteep your cords this liquour, and let them drie again. Then take ree parts of wax, two of reſin, one of ſulphure, e of black pitch, half of turpentine, a quarter campher; melt and mix all that well together, en cover your cords after the manner of a ax candle, and joyn foure of them together, d in the middle of them a ſtaff of ſallow about e thickneſſe of a finger, prepared as the cords matches above ſaid.

To diſſolve ſaltpeter.

Put to one pound of ſaltpeter two ounces of ater, then ſet it a melting over the fire in a ttle. It will alſo diſſolve alone, but not ſo ea-y.

To bring ſaltpeter to flower.

Diſſolve the ſaltpeter over the fire, then ſtirre with a ſtick untill it come to be like meal.

To make roch petre.

You muſt melt it alone in a kettle, then let it ow cold.

To make flowers of ſulphure.

Melt ſulphure in a limbeck, and the flowers ill gather together about the helm.

To better the flowers of ſulphure, melt them d lay them into ſtrong vineger.

To make an excellent ſulphure, take one pa of flowers of ſulphure, melt it: put into it half part of quickſilver, and ſtirre it ſoftly over ſmall fire, untill all be mixed, then ſlake it wi ſtrong vineger.

To make excellent coal.

Take young twigs of haſle or ſallow, or th ſtock of a vine, put them in ſmall pieces into a earthen pot cloſe covered, then ſet the pot on th fire untill the twigs be burnt; their coal is ve good.

To make good powder for muskets and piſtols.

Take ſeven parts of ſaltpeter, one part of ſu phure, and one part and a quarter of charcoal; rather eight parts of ſaltpeter, one part of ſu phure, and one part and one fift part of coa beat it altogether very throughly, and ſprinkle over with good vineger, then grain it.

To make roch fire.

Take one part of common ſulphure, melt it an earthen pot, being melted put into it half part of courſe grained powder well dried, ſal peter one third part, beaten charcoal half a par put theſe things together by little and little, b ing well mingled, poure them on the flore, an you have the roch fire.

To make burning bruſh-faggots to caſt into the moat, to ſhew light in the night.

Take roch fire and melt it, then anoint the fag gots with it, or joyners chips, or elſe anoint the with turpentine.

To make fireballs to set places on fire.

Take roch fire one part, saltpeter one part, mpher one eighth part, fine powder one eighth rt, beat each of them severally, then mix them gether with your hand, and put them into an llow ball, having holes in divers places, with ds amongst it.

Otherwise.

Take one part of campher, one part of salt- ter, half a part of sulphure, one third part of al, all beaten to very fine powder, then mixed th petroll untill the matter be set in clods, n set it a drying; the older it be the better it then you must load the hollow balls, having es of sufficient bigness, and give fire to them a match or week.

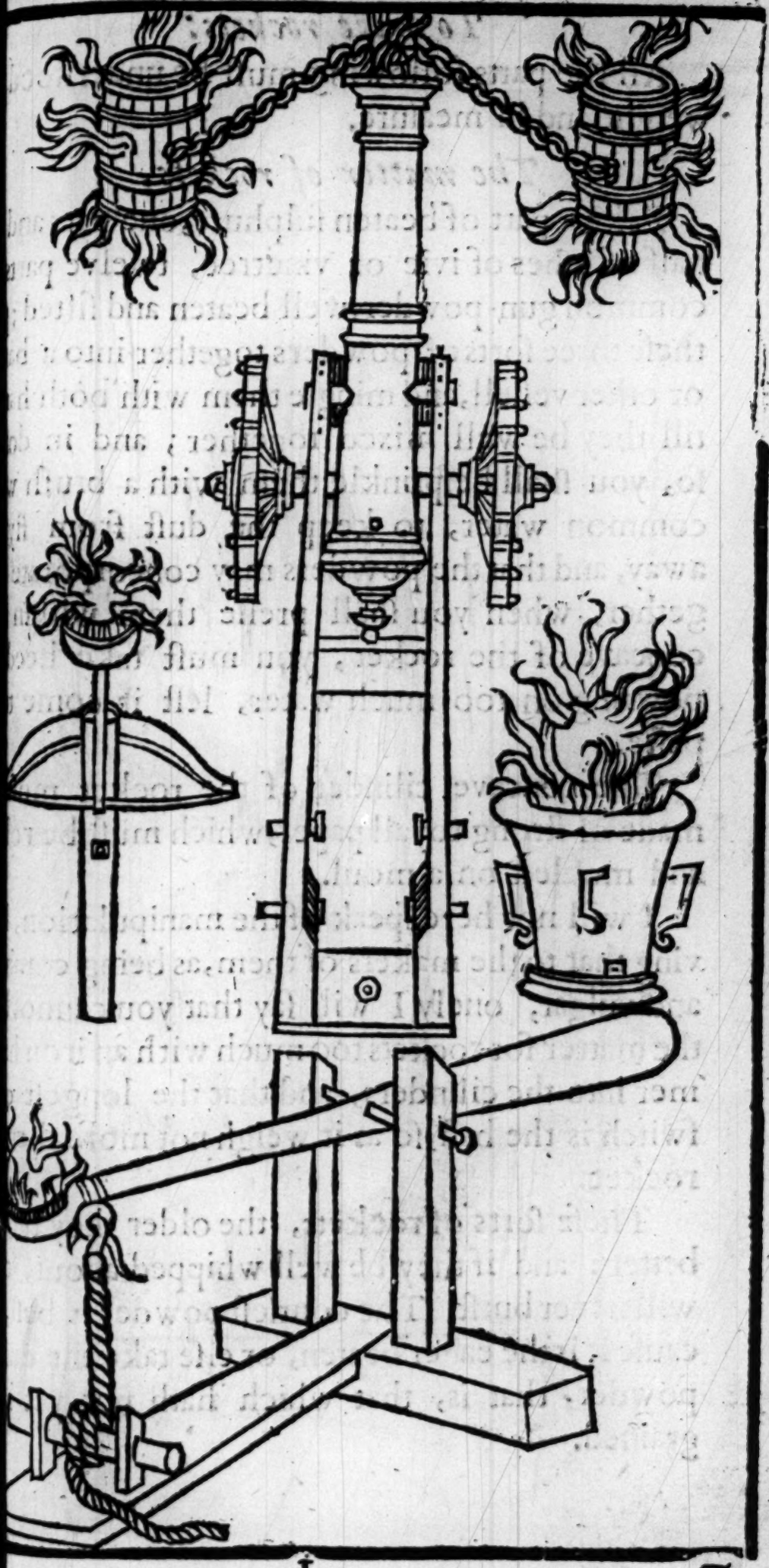
To make the match or week

Take half a quarter of powder, a quarter of tpeter, two ounces of *aqua vitæ*, half a septier vineger, and one pinte of urin, let all this be lted together; being dissolved, put into it rse-spun-cotten, untill it have sucked it all up ng warm, and you shall have a violent week. ke it out while it is moist, and by pieces of o, three, or foure foot long, rowl it with your nd on a table strewed with well beaten pow- , and being so powdred, hang them in the dow to drie, then lock them up in some drie ce.

To make a fire trunk.

Take a piece of light wood of three foot a
an half, or foure foot long, bore it through fr
the one end to the other with a hole of an i
in diameter, make the wood very ſmooth wi
in and without, which muſt be an inch thi
and of a like bigneſſe every where; place at
one end an half pike, which may enter half a f
in at the hole, and nail it ſure; whip the tru
with ſtrong packthred, then anoint and knu
it with reſin and wax melted together, to k
it from water. The mixture of the powders
twelve parts of ſaltpeter, ſix of ſulphure, ſix of
non powder, ſix of fine powder, two of gl
meanly beaten, two of quickſilver, and of ſal
moniack; beat all theſe ſeverally, then mix th
together, and make a paſte of them with oyl
peter, more hard then ſoft, then take hards
make little balls with the mixture above ſaid,
the bigneſſe of the caliver of the trunk, and
them drie, and binde them with ſmall wyer.
charge the trunk, put a charge of beaten pow
in the bottome of the trunk without ramm
of it, put a ball upon that, and then a little
your mixture, continue thus untill it be fill
augmenting the charges of powder, ſo that
laſt be of two charges. You are to give fire
this trunk by the mouth of it with a match
week.

Div



Divers instruments to cast fireworks.

To make rockets:

All the parts following muſt be underſtood
weight and in meaſure.

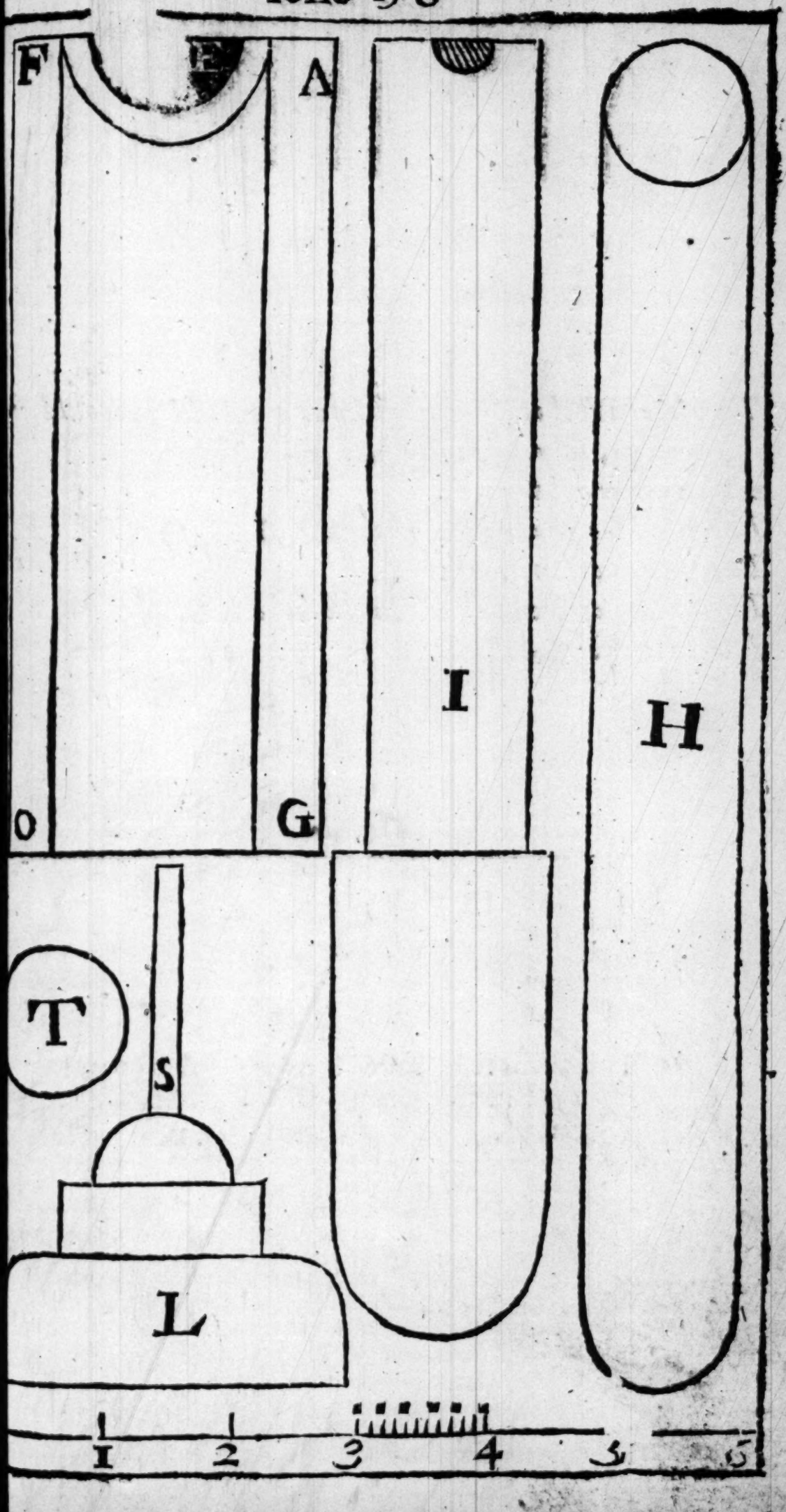
The matter of rockets.

Take a part of beaten ſulphure, one part and
half of aſhes of ivie or vinetree, twelve part
common gun-powder, well beaten and ſifted;
theſe three ſorts of powders together into a ba
or other veſſell, and mingle them with both ha
till they be well mixed together; and in do
ſo, you ſhall beſprinkle them with a bruſh w
common water, to keep the duſt from fl
away, and that the powders may concorporate
gether, when you ſhall preſſe them within
concave of the rocket, you muſt take heed
powring on too much water, leſt it come
paſte.

The concave cilinder of the rocket muſ
made of ſtrong royall paper, which muſt be ro
and mouled on a moul.

I will not here ſpeak of the manipulation,
ving that to the makers of them, as being com
and vulgar, onely I will ſay that you cannot
the matter for rockets too much with an iron h
mer into the cilinders, and that the longeſt
ſwitch is the beſt, ſo as it weigh not more then
rocket.

Theſe ſorts of rockets, the older they be
better: and if they be well whipped about,
will never burſt. The courſeſt powder is beſt
cauſe it is the eaſier beaten, or elſe take the du
powder, that is, that which hath not yet
grained.


F
E
A
I
H
O
G
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L
1
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3
4
5

To make a rocket, you must have a mould to mould you
paper on, as you see in figure. H.
A rammer or drift. I.
The mould to charge the rocket. A, F, G, O.
The breech of the rocket. L.
The needle of iron fastned in the breech. S.
The bignesse of the starres. T.

¶ This leaf is to be placed betwixt *folio*'s 156 and 157, in the Art of Warre or Militarie discourses.

To make cornet-rockets, which draw fire after them untill they burſt.

Take a part of beaten ſulphure, a part of aſhes of vie or vine, half a part of oſier coals beaten, and welve parts of gun-powder beaten and ſifted, and ix it as hath been ſaid before.

To make the compoſition of ſerpents which are added to rockets.

Take aſhes of vine one part, and of gun-powder eaten and ſifted twelve parts, and load the con- ves of the quills therewith; and if you would ve the ſerpents to crack, you muſt make them paper as the rockers, and they muſt have a pe- rd of grained powder at one end.

To make the compoſition to charge ſtarres.

Take one part of beaten ſulphure, one part of wder, two parts of ſaltpeter, and half a part of al of oſiers; all being well beaten.

Of this compoſition take the bigneſſe of a uſket buller, cover it with hards, and tie it about ith thred.

You muſt pierce through theſe ſtarres with an n bodkin of ſufficient bigneſſe to thred them, a ſtring of beads or a ſtring of match to give e to them.

Of the militia of the Grecians.

Chap. XVI.

THeir foot were divided into two kinds, pike and ſuch as uſed flying weapons.

The pikes bore a target, or a corſlet and greves a pike from 20 to 24 foot long, and a ſword.

The ſtrongeſt of them covered themſelv with a Macedonian target of braſſe, being fou foot in diameter.

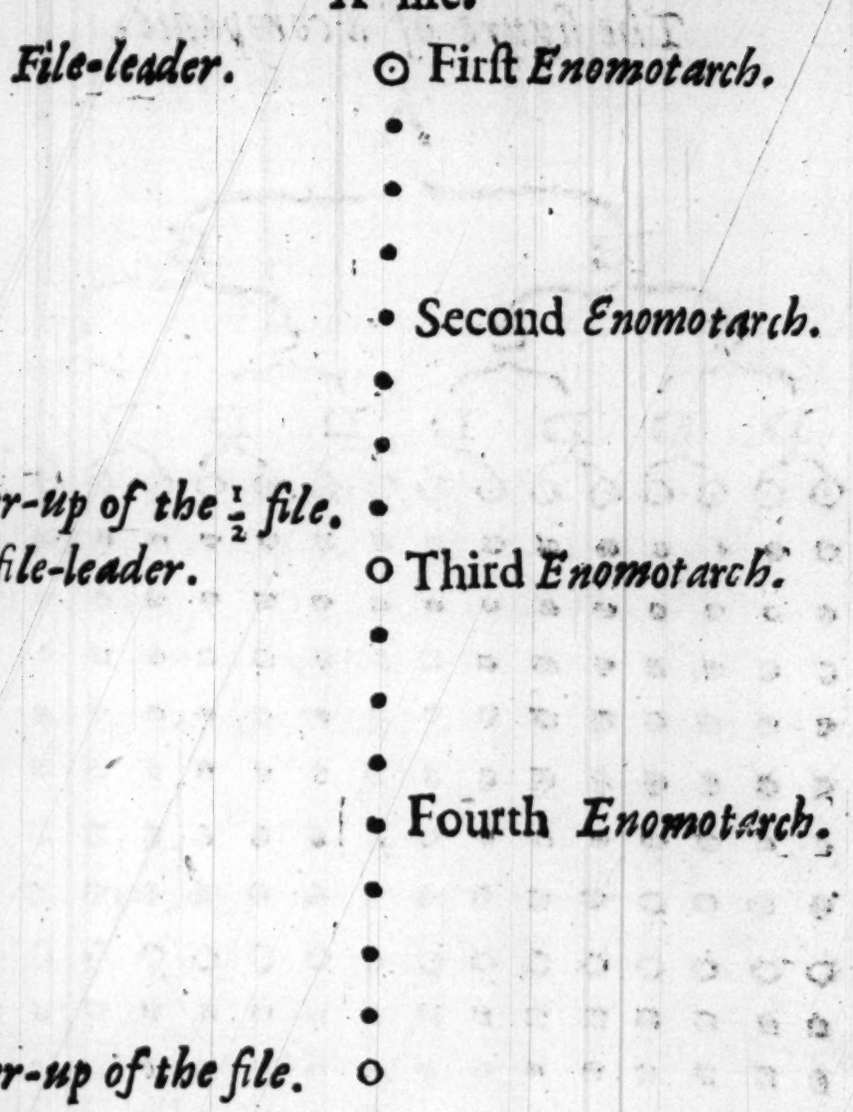
All the pikes were called heavie armed.

They which uſed flying weapons (which we called the light armed) carried wicker targe bows, darts, and ſlings.

The heavie armed ſouldiers were thus diſpoſ of, 16 men made a file: the firſt man being t file-leader, commanded the whole file; the eigh man was the bringer-up of the front-half-file; t ninth man was the half-file-leader, and the ſ teenth man was the bringer-up of the file.

The whole file was divided into foure equ parts, the firſt ſouldier of every fourth part w called *Enomotarcha*, and had command over t other three.

A file.

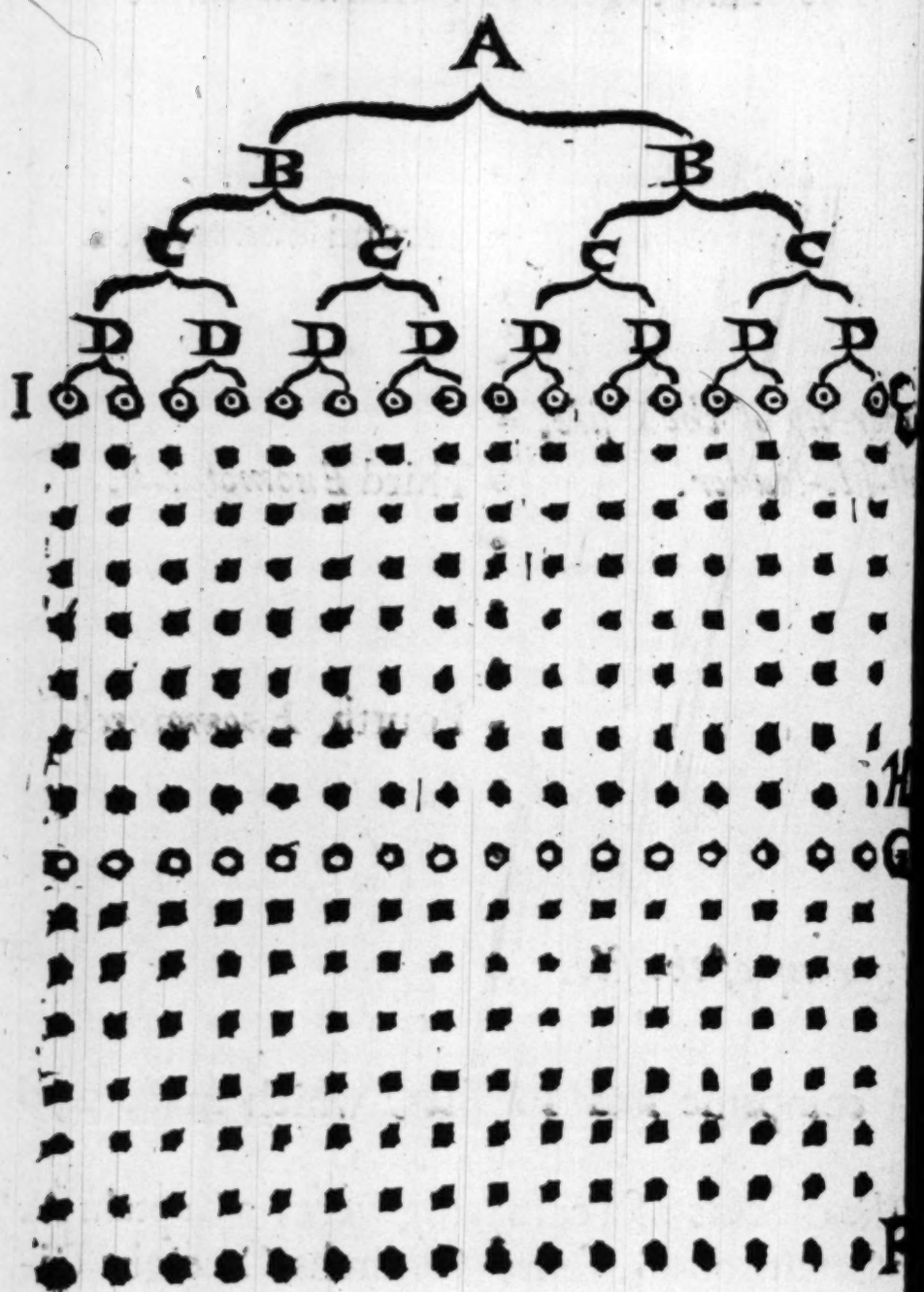


A companie had 16 files, which made 256 n.

The officers of a companie were, a Captain A. o Centurions B. foure Tetrarchs C. eight Di-chites D. 16 file-leaders I, E. 16 bringers-up the front-half-files H. 16 half-file-leaders G. d 16 bringers-up of the files F.

Besides these they had an Ensigne, a Sergeant, rumpet, a Rear-commander, and a Cryer.

The figure of a companie.



The dutie of the officers was to instruct th
souldiers in all the militarie motions; these m
tions were, to stand right in ranks and files, to f
to the right, left, and rear; to double files
ranks; to perform their countermarches
wheelings.

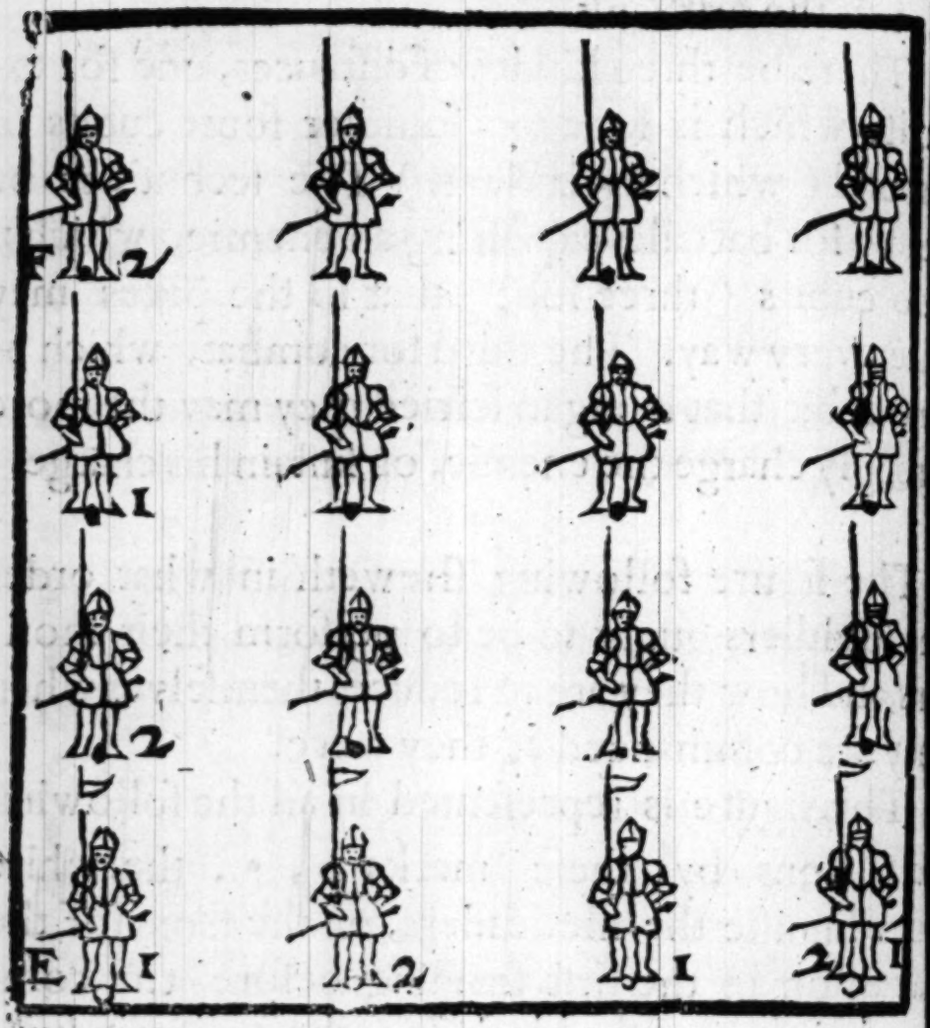
To render this more intelligible, I will describe each of them apart. First, the companie is drawn up into a body (as hath been shewed before) then the ranks and files are made straight and even, and they take their distances; E. F. is the first file, E. I. is the first rank.

There be three kindes of distances, one for exercise, which is for every souldier foure cubits of ground (which is six foot.) The second, to be ready for battaile expecting an enemie, which is two cubits (three foot) that so the pikes may face every way. The third for combat, which is one cubit, that being so serried they may the more strongly charge the enemie, or sustain his charge.

The figure following sheweth in what order the souldiers ought to be to perform their motions, and how they are to reduce themselves when they are commanded as they were.

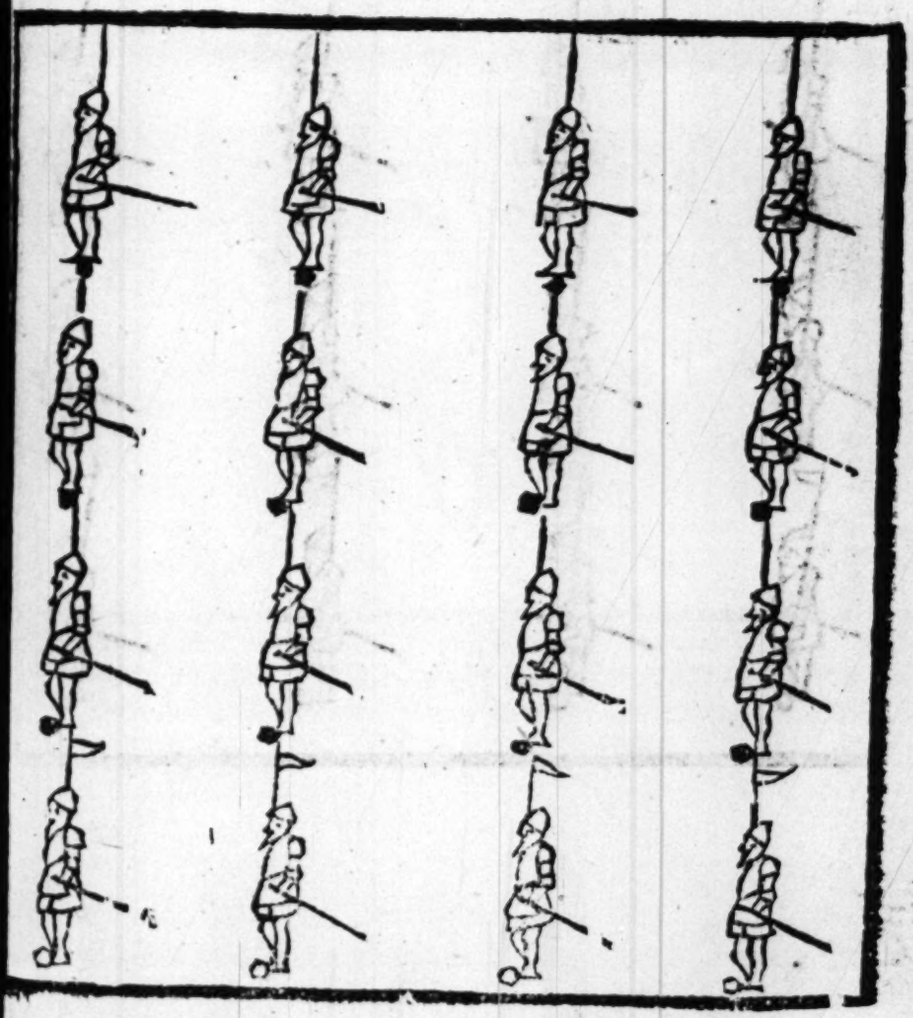
This figure is represented in all the following battaillons by these marks o, •, the white ones signifie the file-leaders, or the front of the battaillon in the first standing before the command given, and the black ones the ordinarie souldiers. The small pricks shew the way by which every souldier moved, the figures of men shew in what form the battaillon standeth after the motion according to the command given them, and the cypher figures placed in the ranks and files shew which are to stand and which to move, or which are leaders, and which are followers.

The ſtanding of ſouldiers which have made even their ranks and files, attending the word of command to perform the exerciſe.



To cauſe all the battaillon to face to the right, every ſouldier muſt turn his face to the place where his right hand was.

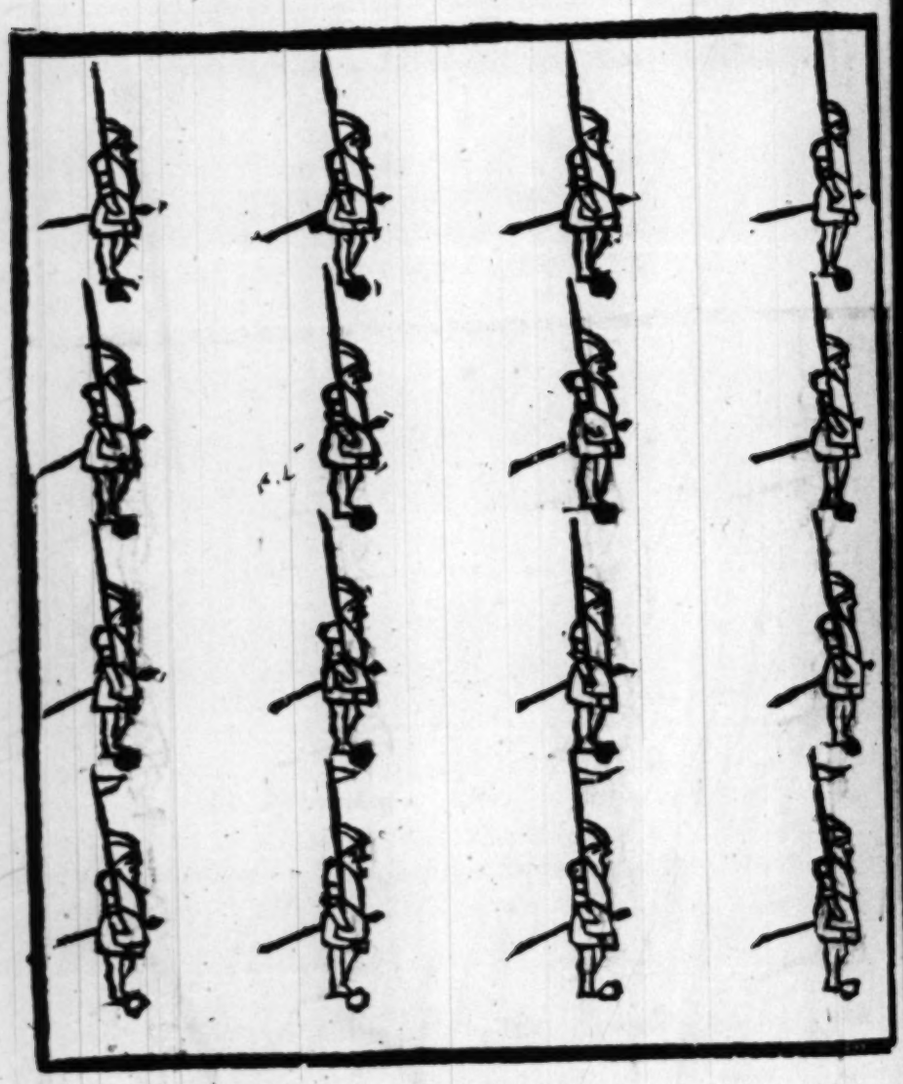
A battaillon faced to the right hand.



To

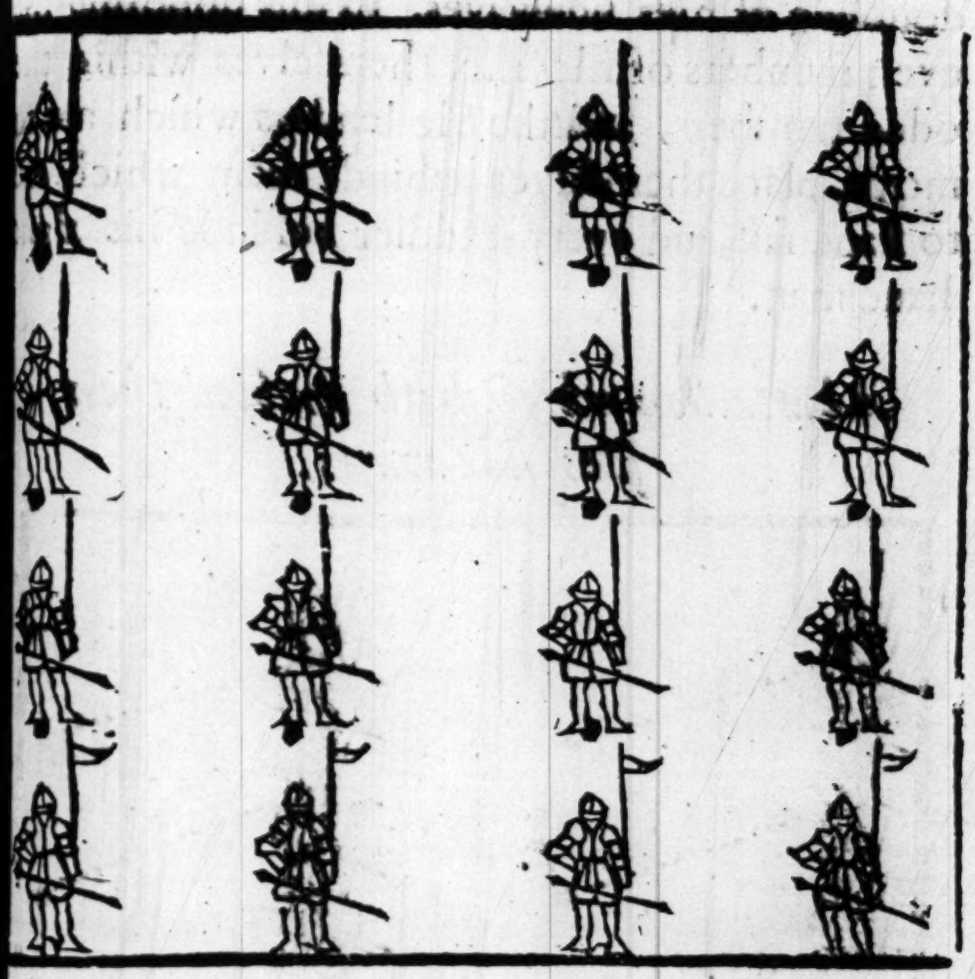
To cauſe all the battaillon to face to the left every ſouldier muſt turn his face to the place where his left hand was.

A battaillon faced to the left hand.



To cause the battaillon to face to the rear, eve-
y souldier must turn his face by the right hand
till it be where his back was.

A battaillon faced to the rear.

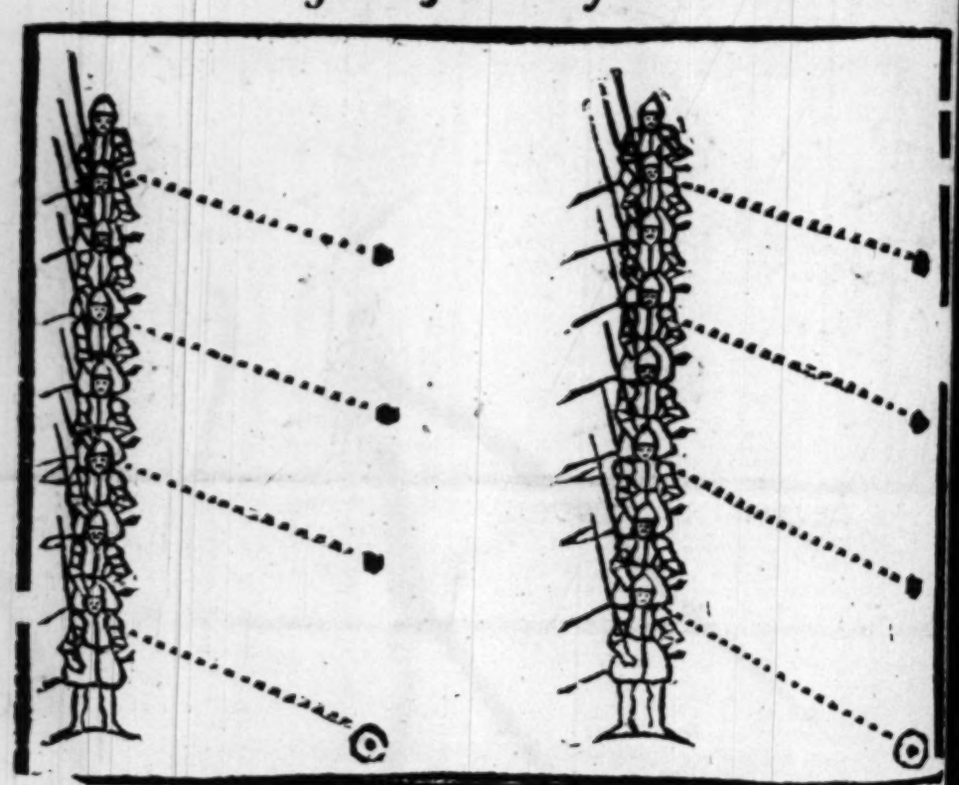


To

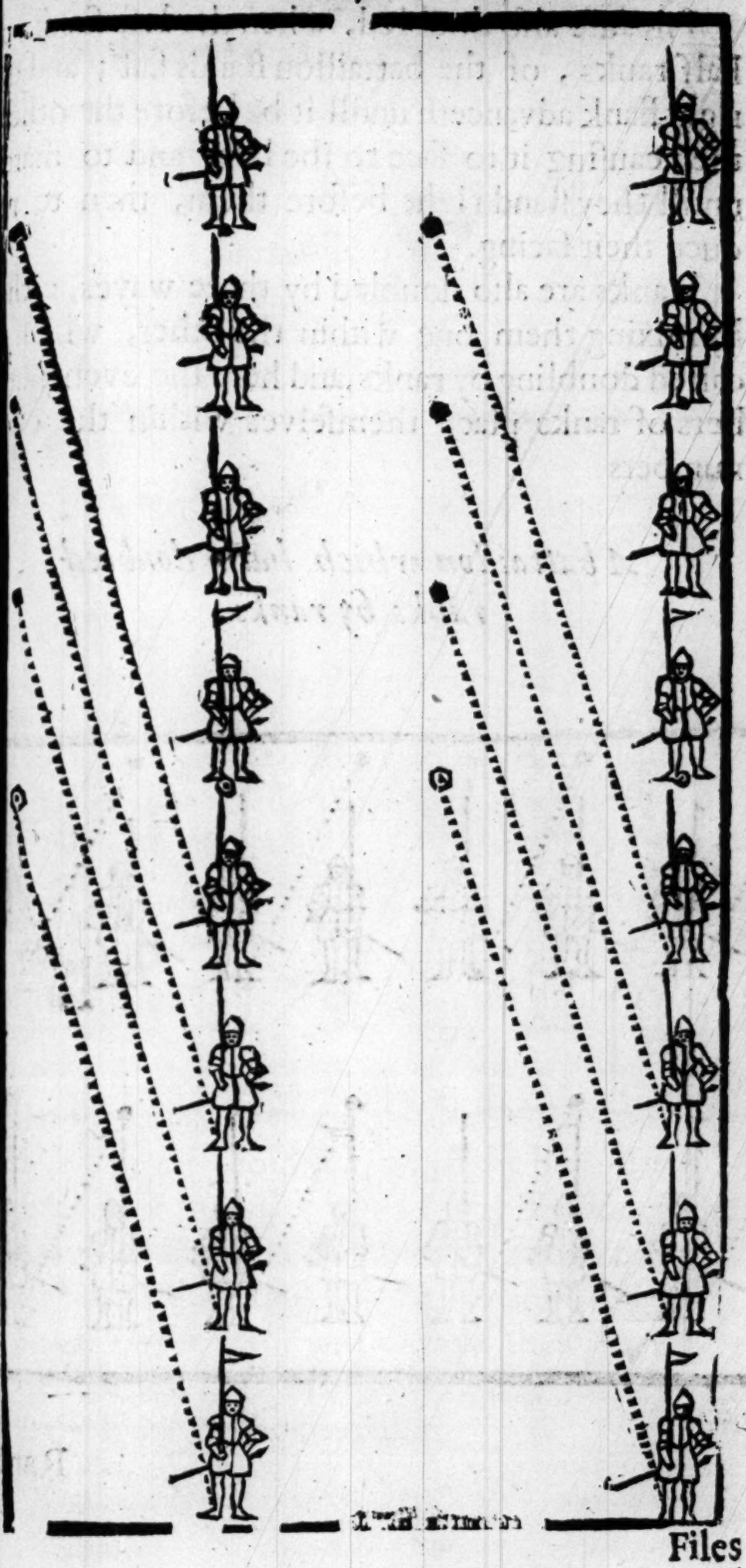
To double files or ranks, is to put two into one. Doubling of files is called doubling the flanks, or doubling the depth; doubling of ranks is called doubling the front.

Files are doubled after three wayes, either in inplacing the one within the other, which is called doubling of files sidewayes. In this doubling the even numbers of files mix themselves within the odde numbers, and the file-leaders which are to move, place themselves behinde them which are to stand fast, and every souldier behinde his right hand man.

A battaillon which hath doubled their files side-wayes.



Files are also doubled when one is placed before the other, which is called doubling of files advancing, when the odde numbers place themselves before the even numbers, as the following figure sheweth.

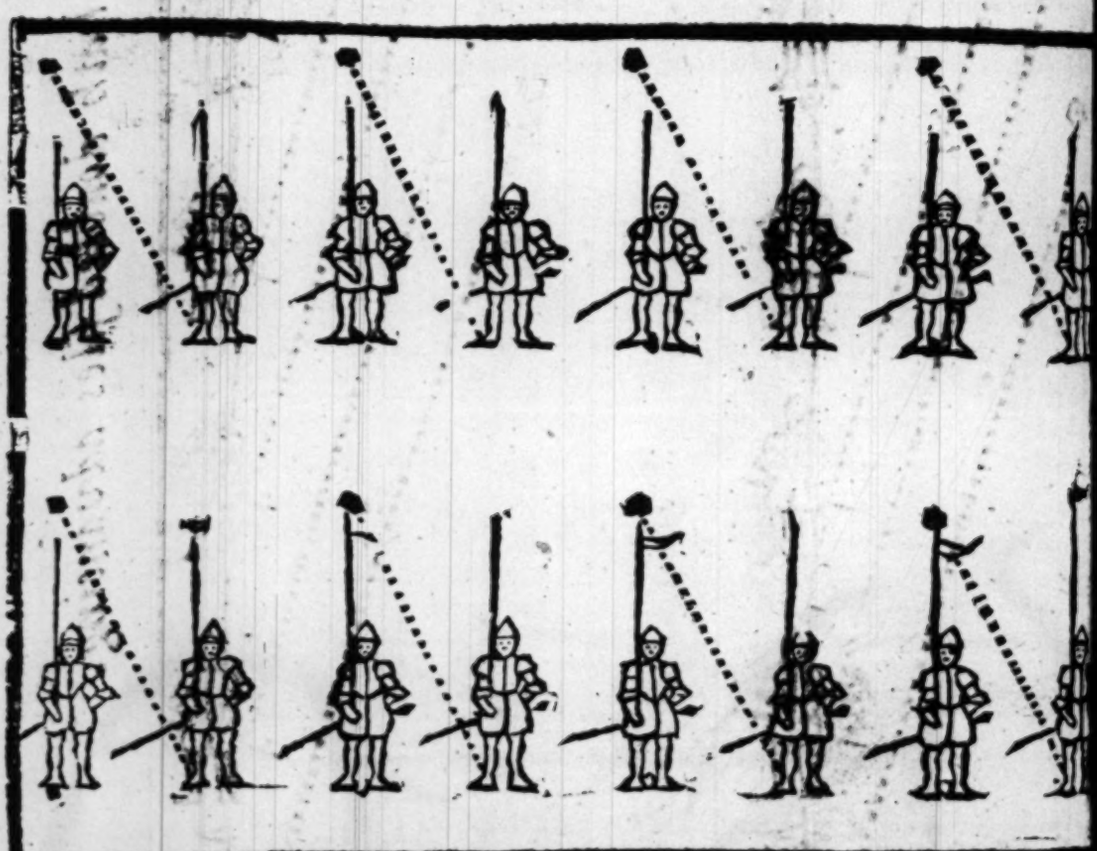


A battaillon which hath doubled files advancing.

Files are alſo doubled, when the left flank, c
half ranks, of the battaillon ſtands faſt; and th
right flank advanceth untill it be before the othe
then cauſing it to face to the left, and to marc
untill they ſtand right before them, then to r
duce their facing.

Ranks are alſo doubled by three wayes, eith
by mixing them one within the other, which
called doubling by ranks, and here the even num
bers of ranks place themſelves within the od
numbers.

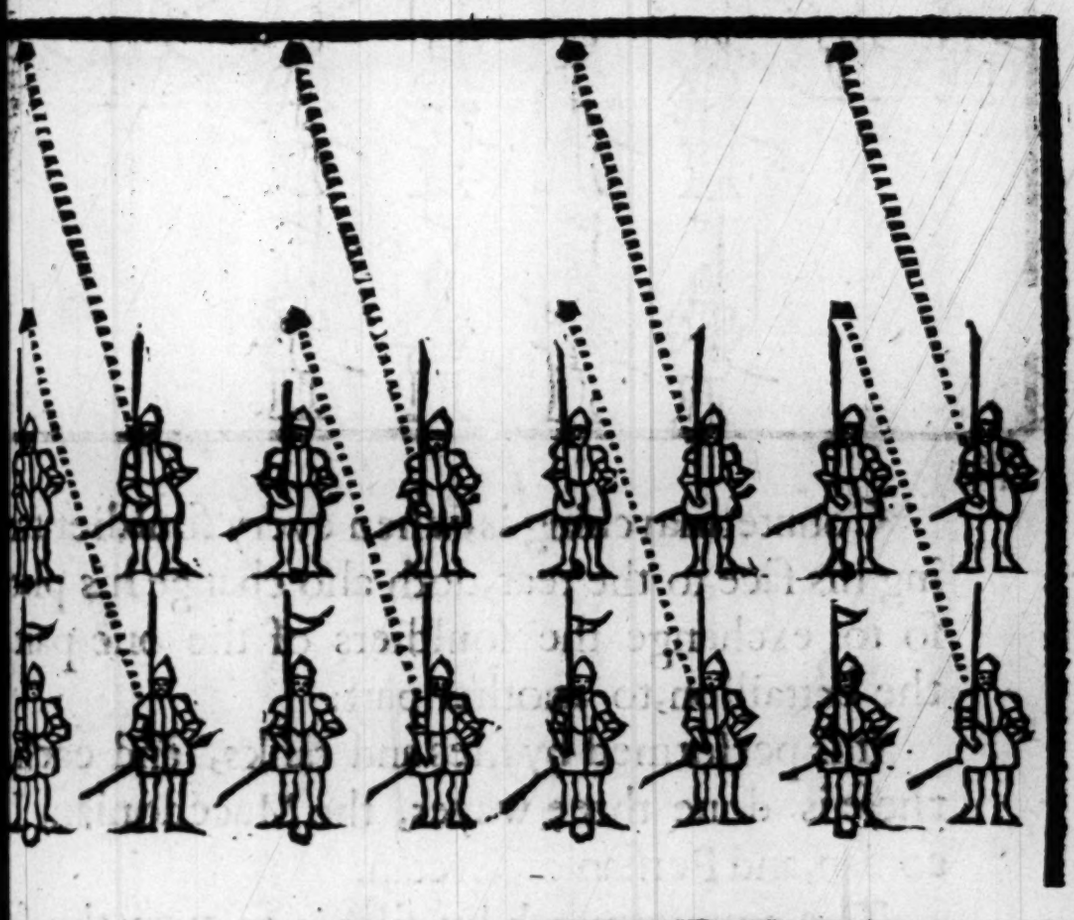
A battaillon which hath doubled ranks by ranks.



Rank

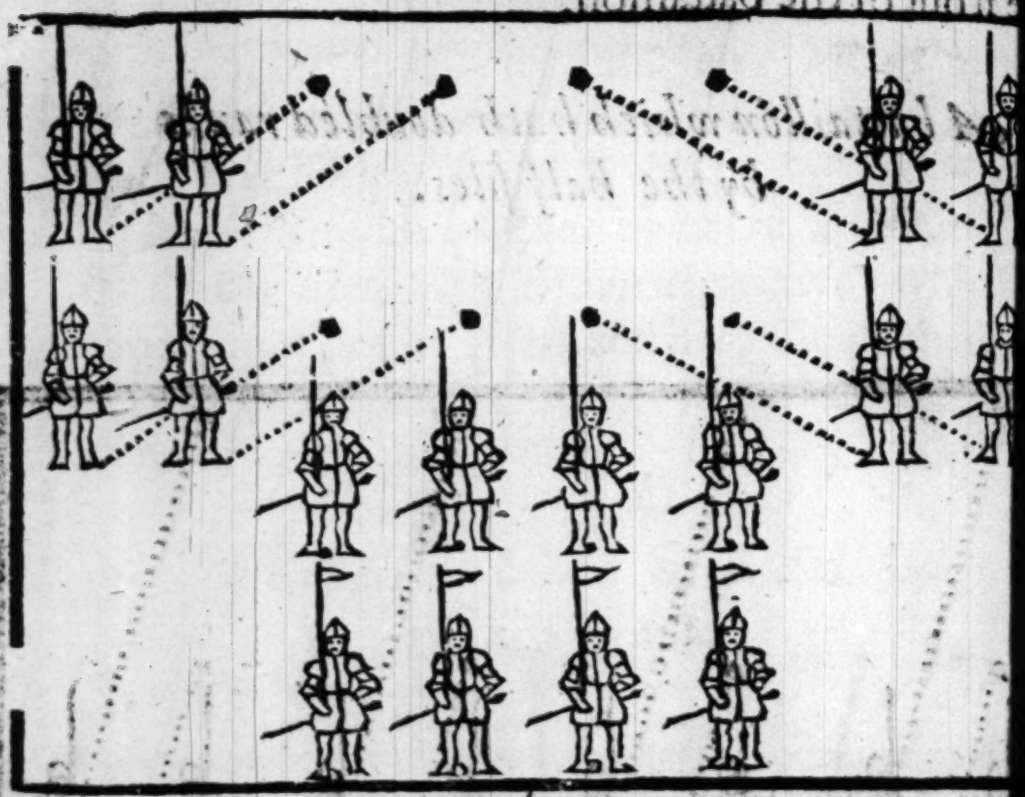
Ranks are alſo doubled, by cauſing the half files advance, untill the half-file-leaders come up to e front of the battaillon.

A battaillon which hath doubled ranks by the half files.



Ranks are alſo doubled, when the battaillon di-des it ſelf at the half files, or rear diviſion. The ar diviſion again divideth it ſelf into two equall rts at their half ranks, the one part to the right, e other to the left, and each of theſe parts ad-nceth untill the half-file-leaders ſtand even ith the front of the battaillon.

A battaillon which hath doubled ranks on the flanks.



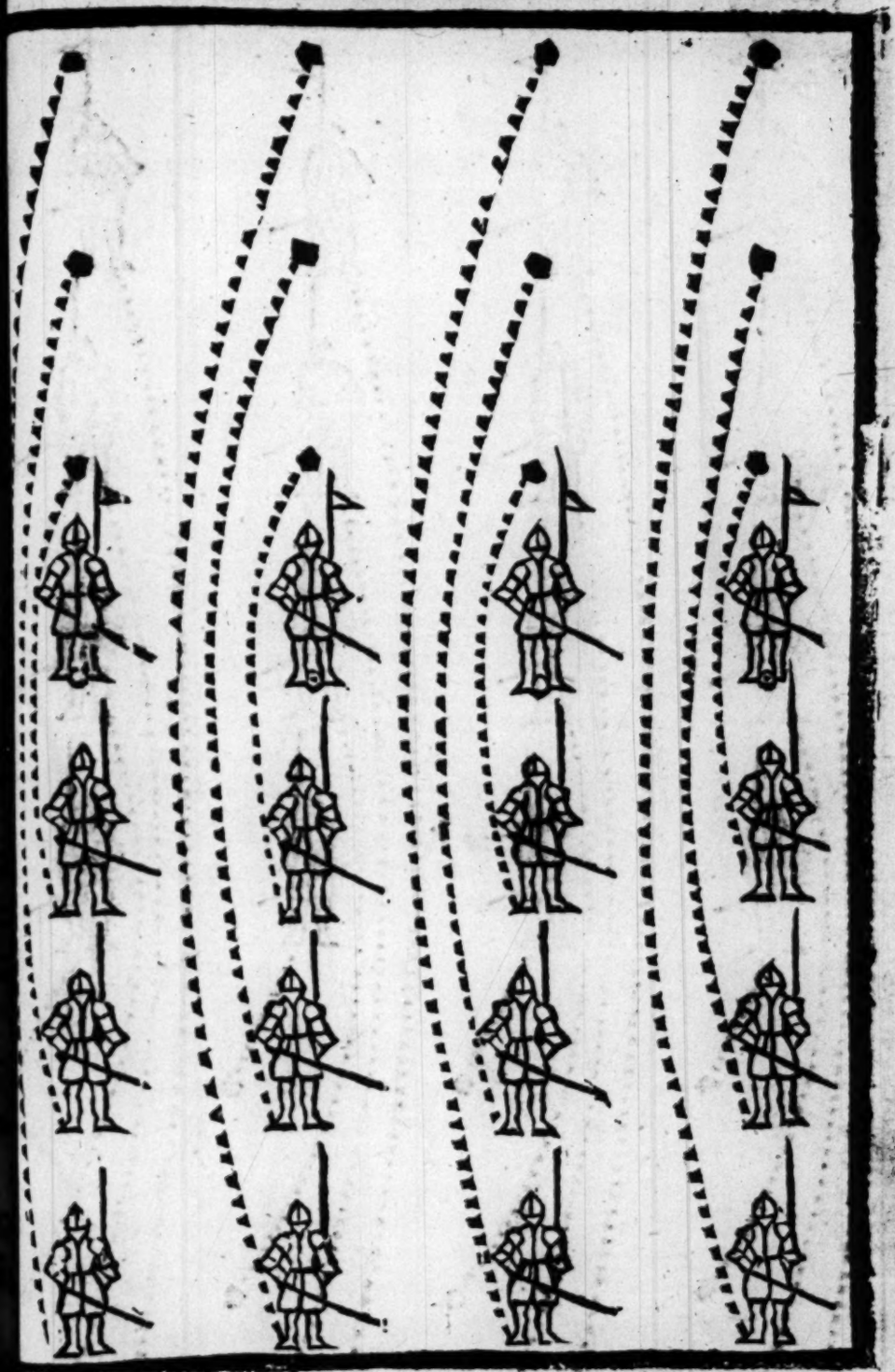
Countermarching is, when every ſouldier tu
ing his face to the rear, doth alſo change his pla
ſo to exchange the ſouldiers of the one par
the battaillon, to another part.

It is performed by files and ranks, and each
theſe is done three wayes, the Macedonian,
conian, and Perſian or Cretan.

The countermarch by files is to turn the f
to the rear, and ſo to bring the file-leaders ag
to be foremoſt.

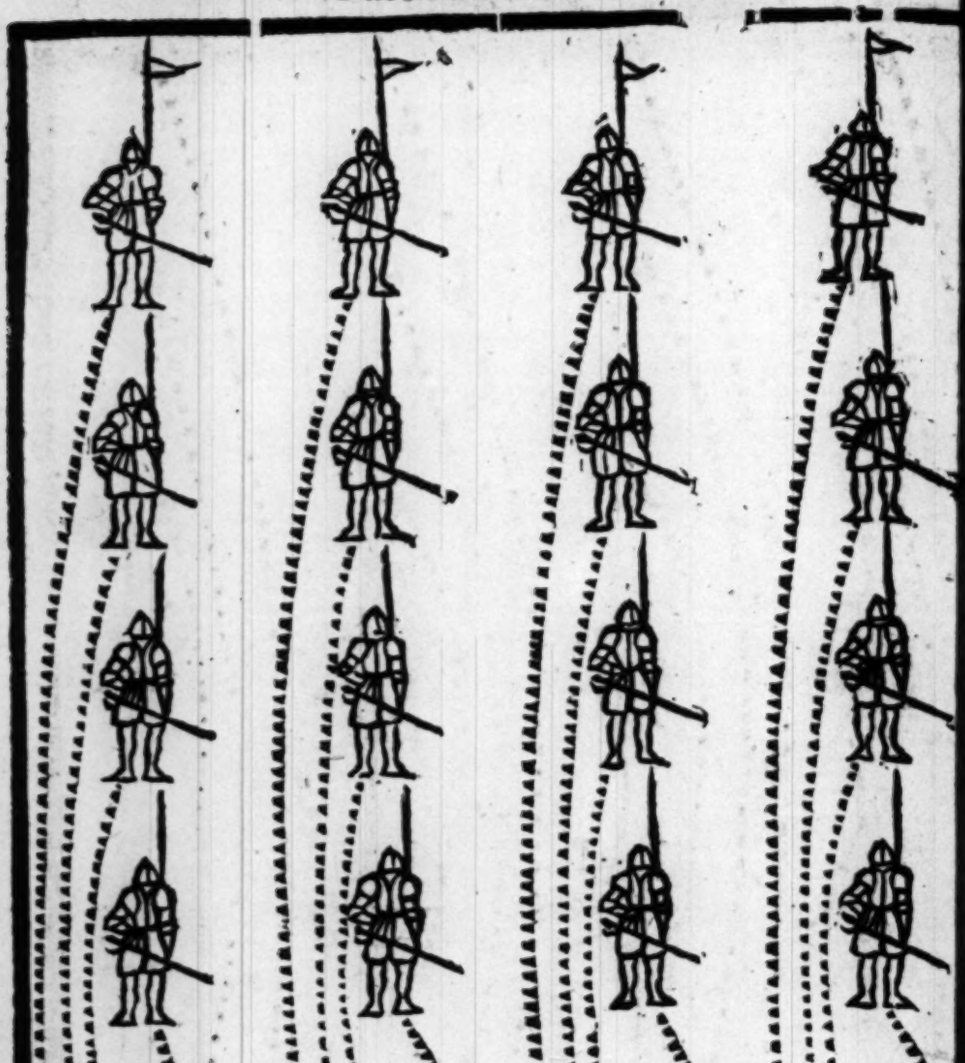
The Macedonian countermarch by files
when the file-leaders face to the rear and ſta
faſt, then all the reſt of each file paſſe through a
ſtand behinde their own leaders, by which me
the battaillon leaves before it, for the field
combat, the ground where it ſelf ſtood, as appe
eth by the figure following.

A battaillon which hath performed the Macedonian countermarch.



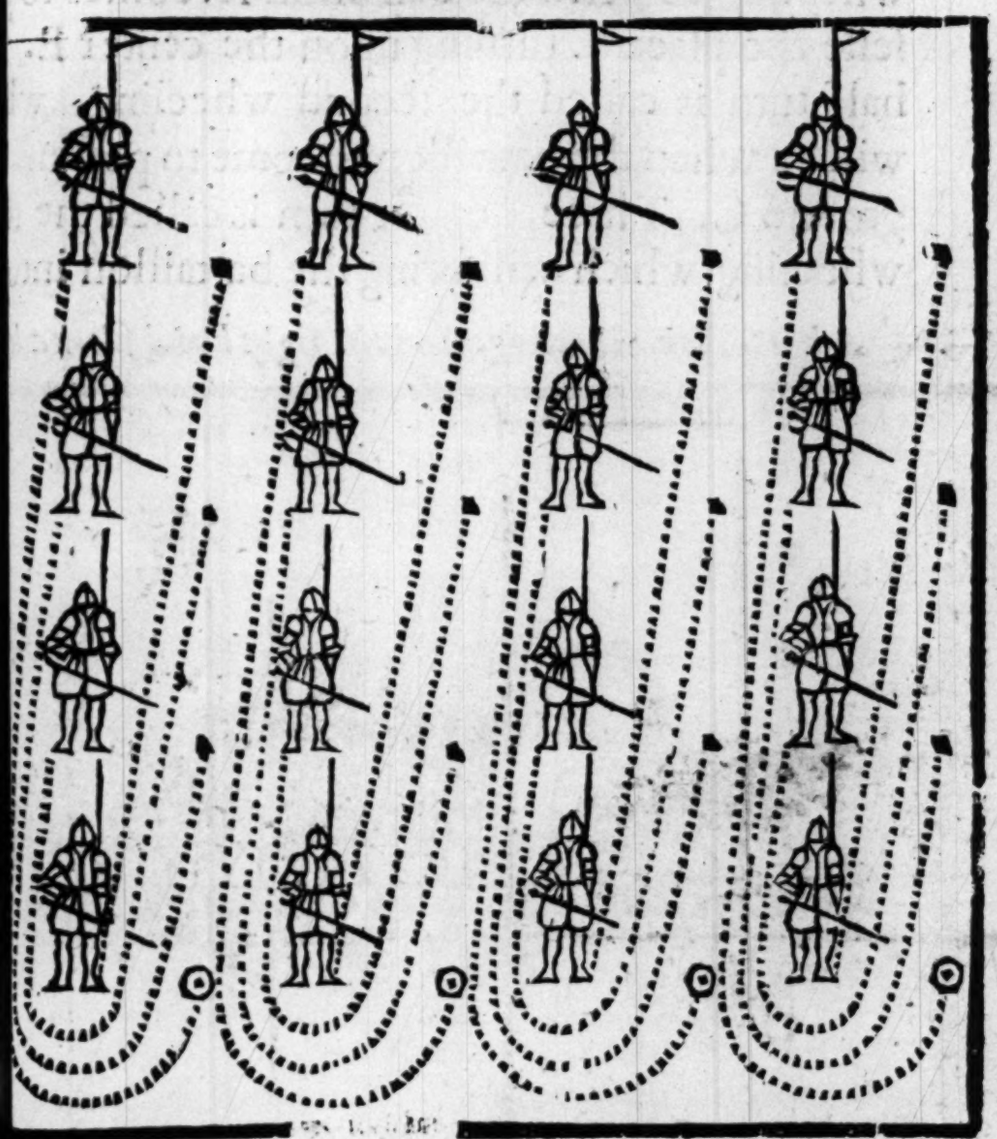
The Laconian countermarch by files is when
file-leaders facing to the rear, cauſe all the reſt
heir file to follow after them, and lead them to
ther ground, leaving that ground behinde
m where they formerly ſtood; or rather the
ngers-up face about, and every man of the file
ceth himſelf before his bringer-up, in their due
ces, untill the file-leader come up to the front.

A battaillon which hath performed the Laconian countermarch.



The Perſian or Cretan countermarch, is when
e file-leaders face about, and draw their files af-
them, and come into the place of the bringers-
; and the bringers-up come into the file-lea-
s places; the battaillon poſſeſſing the ſame
ound it had before.

attaillon which hath performed the Perſian or Cretan countermarch.



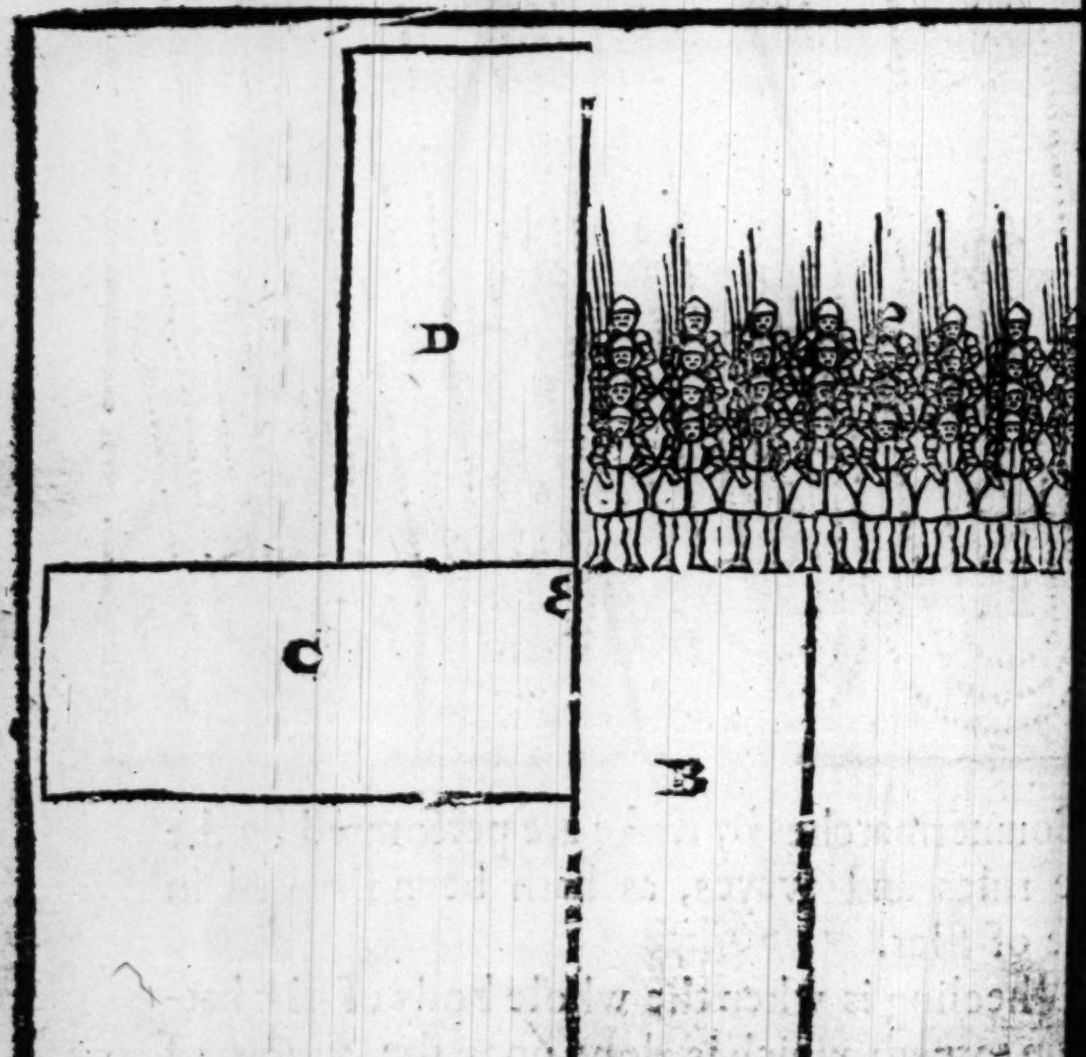
Countermarches by ranks are performed by the
e rules and wayes, as hath been ſhewed in
le of files.

Wheeling is when the whole body of the bat-
on turneth, which is done upon the angles of

the battaillon (upon the right or left hand f
-leader) or on the middle of the front (the mid
file-leaders being as the center) or on the cen
of the battaillon.

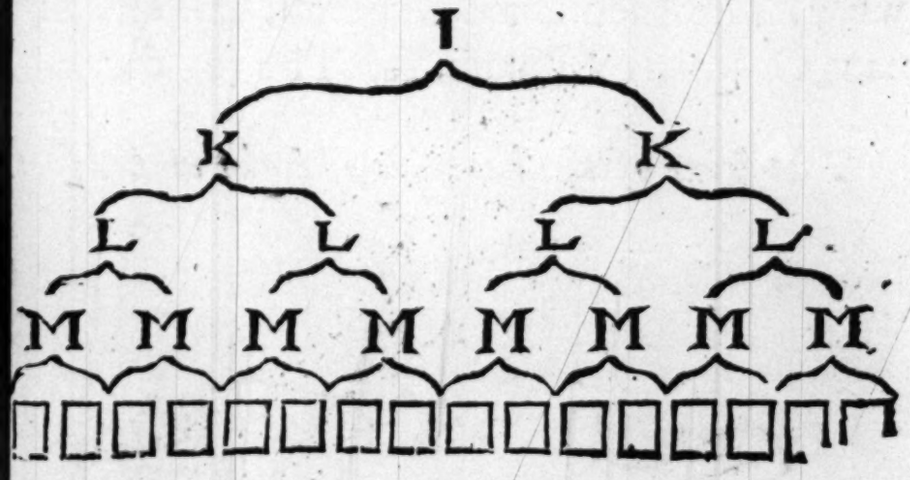
When the battaillon wheeleth upon the r
hand file-leader, it wheeleth to the right ha
When it is upon the left hand file-leader, it wh
eth to the left. A quarter turn is called the
wheeling, as when the battaillon A. comes to
ſeſſe the place B. turning upon the center E.
half turn is called the ſecond wheeling, w
will be when the battaillon is come to poſſeſſe
ground C. Three quarter turn is called the t
wheeling, which will bring the battaillon into

A battaillon wheeling upon the right hand file-lead



The words of command are, Make ready your
nes, Put your ſelves in battalia, Make even your
s and ranks, Take your diſtances, Advance
ur pikes. Faces to the right, As you were; Fa-
to the left, As you were; Faces to the rear, As
i were; Files to the right double, As you were;
uble your files advancing, As you were; Dou-
your files by the half ranks, As you were;
nks double by ranks, As you were; Ranks dou-
by the half files, As you were; Ranks double
both flanks, As you were. Countermarch, &c.
you were. Wheel, &c. As you were.

ixteen companies made a regiment, which con-
d of 4096 men; the officers of this regiment
e, one Colonell, I. two Lieutenant Colonels,
foure Sergeant majors, L. Eight Colonels aſ-
nts, M. The ſquares repreſent the companies,
h of them having their Captain, □.



Foure regiments made the battaile of heavie
ed foot; the two on the right hand were called
right wing, and the two on the left, the left
g.

The officers of theſe foure regiments were, the
erall of foot, N. The Lieutenants Generall, O.
regiments are, P.

The front of the battaile of heavie armed foot



So much concerning the heavie armed fo
which differed not from the light armed conce
ing their order, but onely in their number, for
light armed had their files but of 8 deep, in all
reſt they were alike. For they had as many files
many companies, as many regiments, as many
cers, diſpoſed in the ſame order.

Foure regiments made the front of their
taile, and two made a wing: their comman
were, The Lieutenant Generall, Q. The Lie
nant Colonels aſſiſtants, R. The regiments, S

The front of the battaile of light armed foot



Sometimes the light armed foot marched be
the heavie armed, ſometimes they marched
their flanks, ſometimes between them, and ſo
times in their rear.

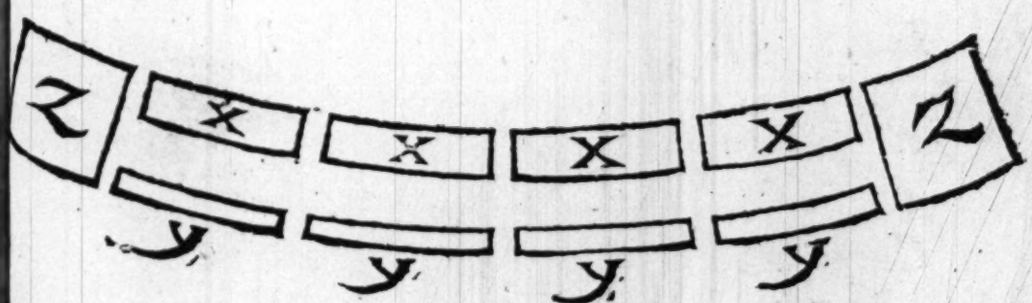
The form of battaile of the foot, when the heavie armed marched before the light armed.



T. is the left wing. V. is the right wing. X. the avie armed regiments. Y. the light armed regiments.

The horſe were ſometimes placed round about armie by ſquadrons, ſometimes on the wings, alſo on the rear, ſometimes amongſt the armie the wings of the battaillons, and ſometimes ely on the wings of the armie, which they did oſt uſually, dividing them into two equall parts, cing the one half on the right wing, and the er half on the left wing.

The form of the armie ranged in battaile, as well Infanterie as Cavallrie.



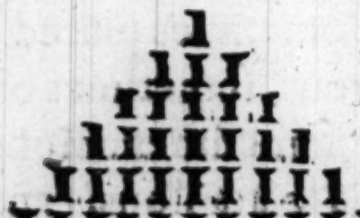
X. are the heavie armed foot. Y. the light med foot. Z. the horſe, the one half on the right ng, and the other half on the left.

As they which uſe flying weapons were b
half the number of the pikes, ſo the horſe we
but half the number of thoſe which uſed flyi
weapons, that is, a fourth part of the foot.

The Perſians and Sicilians diſpoſed their troo
of horſe in ſquare bodies, as the French do no
adayes, but the Scythians, Thracians, and Maced
nians put them into a triangular form, or wedg
and the Theſſalians into a rhomb or diamond.

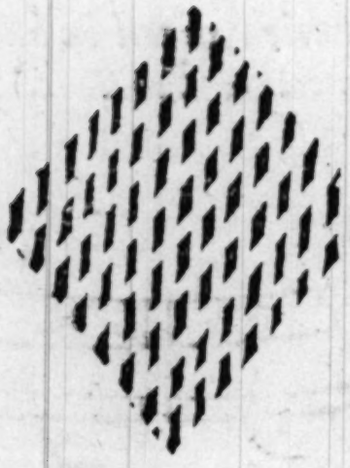
They ordered their horſe in theſe wedges a
rhombs, ſometimes by files, and ſometimes
ranks, as in theſe figures.

Captain. *Ilarchos.*



Lieutenant. *Plagiophylar-chos.*

Captain. *Ilarchos.*



Lieutenant. *Plagiophylar-chos.*

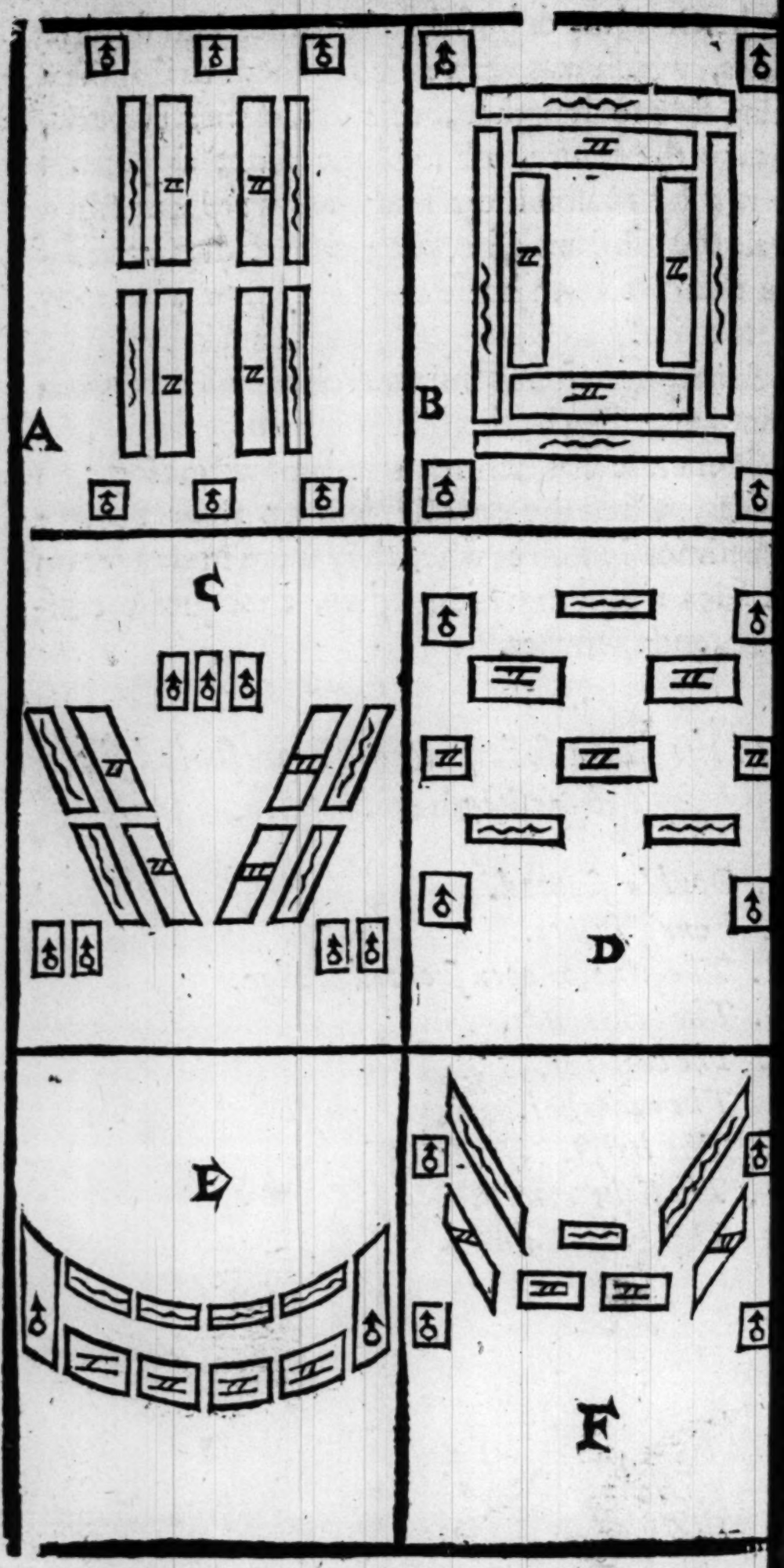
Corporall. *Uragos.*

The Grecians diſpoſed their armies into ſundrie rms, which was very eaſie for them to do, they eing able to lengthen, thicken, open, cloſe it, hange the figure, or turn the front as pleaſed em; by reaſon their ſouldiers were practiſed all the motions aforeſaid; and at the ſound of e trumpet both horſe and foot knew what they ere to do.

Sometime their armie marched with an even ont, according to the form ſhewed before, when eir enemie was before them; ſometimes in two odies, when the enemie was on their flanks; metimes in foure, when they were in danger on l ſides: ſometimes in ſithes, checquers, creſ- nts, and manches.

In the figure following are repreſented ſix diſpoſitions of battaile.

. *Double fronted.*
. *Foure fronts.*
. *The ſithe, or open fronted wedge.*
. *The checquer.*
. *The creſcent.*
The manches.
. *The horſe.*
. *The light armed.*
. *The heavie armed.*


A
B
C
D
E
F

A battaillon which had a greater depth then ront, they called *Orthion*.

That which had the front exceeding the epth, *Plagion*.

That battaillon is called oblique which fight- th by the wings, one wing ſerving for the van- uard.

When the battaile was begun to be ranged by he wings, and was ended at the middle, it was alled *Parembole*.

When they began to range their battaile by the idſt, and finiſhed it on the wings, it was called *roſtaxis*.

When (the heavy armed foot being firſt placed) he light armed were placed at their front, it was alled *Protaxis*.

When (after that the heavie armed were ran- ed) the light armed foot were placed in their ear, it was called *Epitaxis*.

When the light armed foot were ranged in the nterval!s between the pikes, it was called *En- axis*.

When the light armed were placed on the wings of the whole armie, they called it *Hypo- axis*.

Of the heavie armed foot, called Hoplites.

Number of men.	*Files.*	*Greek names of the troops.*	*The names interpreted.*	*Greek names of officers.*	*Officers names interpreted.*
4.		Enomotia.	A quartain.	Enomotarcha.	A quartainer.
8.		Dimœria.	An half file.	Dimœrites.	An half file-leader.
16.	1.	Lochia.	A file.	Lochagos.	A file-leader.
32.	2.	Dilochia.	Two files.	Dilochites.	A Lanſpaſſado.
64.	4.	Tetrarchia.	A ſquadron.	Tetrarcha.	A Corporall.
128.	8.	Taxiarchia.	A centurie.	Taxiarcha.	A Centurion.
256.	16.	Syntagma.	A companie.	Syntagmatarcha.	A Captain.
512.	32.	Pentacoſiarchia.	A double companie.	Pentacoſiarcha.	A Colonels aſſiſtant.
1024.	64.	Chiliarchia.	A brigado.	Chiliarcha.	A Commander of a brigado, or Sergeant major.
2048.	128.	Merarchia.	A double brigado.	Merarcha.	A Lieutenant Colonell.
4096.	256.	Phalangia.	A regiment.	Phalangarchos.	A Colonell.
8192.	512.	Diphalangia.	One wing of the regiment.	Diphalangarchos.	Lieutenant Generall of foot.
16384.	1024.	Tetraphalangia.	The battaile of the heavie armed foot.	Tetraphalangarchos.	The Generall of foot.

8192. 1024. Epiragma. The battaile of light armed foot. Epiragmarchos. The Lieutenant Generall of foot.

Of the light armed foot, called Pſyllagi.

Number of men.	*Files.*	*The Greek names of the troops.*	*The names interpreted.*	*The Greek names of the officers.*	*The officers names interpreted.*
4.		Dimœria.	Half a file.	Dimœrites.	Half file-leader.
8.	1.	Lochia.	A file.	Lochites.	A file-leader.
16.	2.	Dilochia.	Two files.	Dilochites.	A Lanſpaſſado.
32.	4.	Syſtaſis.	A ſquadron.	Syſtaſiarchos.	A Corporall.
64.	8.	Pentecontarchia.	A centurie.	Pentecontarchos.	A Centurion.
128.	16.	Hecatontarchia.	A companie.	Hecatontarchos.	A Captain.
256.	32.	Pſyllagia.	A double companie.	Pſyllagiarchos.	A Colonels aſſiſtant.
512.	64.	Xenagia.	A brigado.	Xenagiarchos.	A Sergeant major.
1024.	128.	Syſtema.	A double brigado.	Syſtemarchos.	A Lieutenant Colonell.
2048.	256.	Epixenagia.	A regiment.	Epixenagiarchos.	A Colonell.
4096.	512.	Stiphos.	One wing of the battaile.	Stipharchos.	The Sergeant major Generall of foot.
8192.	1024.	Epitagma.	The battaile of light armed foot.	Epitagmarchos.	The Lieutenant Generall of foot.

Of the horse.

Number of men.	*The Greek names of the troops.*	*The names interpreted.*	*The Greek names of officers.*	*Officers names interpreted.*
36	Embolos.	Half a troop.	Embolarchos.	A Lieutenant.
64	Archia.	A troop.	Archos.	A Captain.
128	Epilarchia.	A double troop.	Epilarchos.	Sergeant major.
256	Tarentinarchia.	Foure troops.	Tarentinarchos.	Lieutenant Colonell.
512	Hipparchia.	A regiment.	Hipparchos.	Colonell.
1024	Ephipparchia.	A double regiment.	Ephipparchos.	Sergeant major Generall.
2048	Telarchia.	One wing of the horse.	Telarchos.	Lieutenant Generall.
4096	Epitagma.	The grosse of Cavallrie.	Epitagmarchos.	Generall of horse.

Of the Romane Militia, in the time of Polybius.

Chap. XVII.

The Romanes managed their martiall affairs after this manner : They choſe out of all the people ſuch as were moſt fit to bear armes, as well for the Infanterie as for the Cavallrie.

Concerning the Infanterie, the pooreſt and youngeſt of them were appointed to be *Velites*; the next above theſe, to be *Haſtati*; they which were in the flower of their age, to be *Principes*; and the ancienteſt to be *Triarii*.

The armes of theſe foure ſorts of ſouldiers were theſe: The *Velites* bore a ſword, a javelin or dart three foot long, and an inch thick, with an iron at the end one foot long, a target of three foot diameter, and an head-piece of leather; ſome were ſlings, and ſome bows.

The *Haſtati* and *Principes* bore each of them a target (two foot and an half broad, and foure foot long, or foure foot and an handfull) a ſharp-pointed ſword, and cutting on both ſides, and very faſt, an head-piece of braſſe with creſts and plumes, two piles of wood, the one ſlender as a ſtaffe, three cubits long, with an iron at the end; and one thick one, an handfull in thickneſſe, three cubits alſo in length, at the end whereof there was an iron of the length of the pile, half whereof was driven into the wood, which was faſtened ſtrongly thereunto, the other half extended, with a ſharp point, being furniſhed with hooks.

This

This iron, next to the wood, was one finger a
an half thick, the finger being accounted at fou
barly kernels, and the handfull at foure fing
breadth.

The *Triarii* bore the ſame armes which t
Principes did, ſaving the piles, for in ſteed of the
they bore pikes.

The *Haſtati* uſed to bear them in former tim
and had their name from thence, but they quitt
them to take piles.

The *Haſtati*, *Principes*, and *Triarii* bore
breaſt-plate of braſſe or iron, a foot ſquare; a
the richer ſort armed themſelves with ſcales
mails, faſtned together with hooks.

In a legion there were 4200 men of the fou
ſorts of ſouldiers aforeſaid, *Velites*, *Haſta*
Principes, and *Triarii*; divided after this manne
There were 600 *Triarii*, 1200 *Principes*, 12
Haſtati, and as many *Velites*.

As well the *Haſtati*, *Principes*, as *Triarii*, we
divided each into ten parts, called Maniples;
that in a legion there were 30 Maniples, witho
reckoning the *Velites*; for they were equally diſt
buted amongſt each Maniple. The *Haſtati* bei
1200, divided into ten Maniples, each contain
120 men; ſo much were thoſe of the *Princip*
and 60 thoſe of the *Triarii*; and dividing t
1200 *Velites* by 30, to ſerve for ſuch as uſed f
ing weapons to the Maniples aforeſaid, it will a
pear that every Maniple of *Velites* contained
men.

One Maniple of *Haſtati*, one Maniple of *Pri*
cipes, and one of the *Triarii* with the *Velit*
made a Cohort: for there were ten Cohorts i
Legion, and ſix Maniples in a Cohort; name

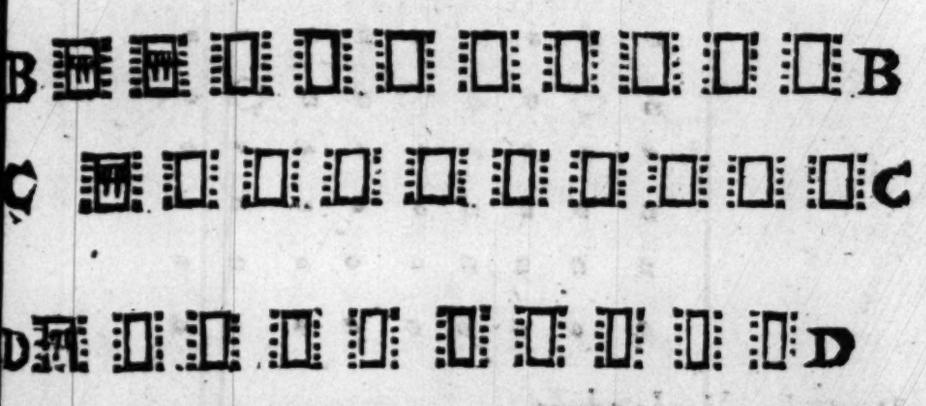
o

e of the *Haſtati*, one of the *Principes*, one of *Triarii*, and three of the *Velites*.

The *Velites* fought disbanded, keeping neither k nor order, and it was their dutie to begin the rmiſh and battaile; but the *Haſtati*, *Principes*, d *Triarii*, were ranged into Maniples. All the niples of the *Haſtati* ſtood in one front, ſo did oſe of the *Principes*, in the rear of them, and oſe of the *Triarii* in like manner in the rear of e *Principes*.

The diſtance of the Maniples was ſuch, that one niple might ſtand betwixt two of them, becauſe t if the *Haſtati* were repulſed, they might re-at into the intervalls or ſpaces which were be-een the Maniples of the *Principes*, and ſo fight ether. And if both *Haſtati* and *Principes* were feated, they might retreat between the Maniples *Triarii*, and ſo fight again all together, as well *ſtati*, and *Principes*, as *Triarii*.

The form of a Legion embattailed.



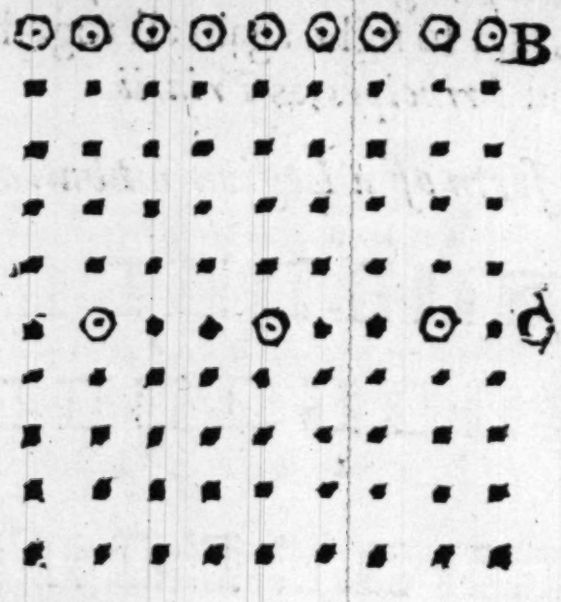
B. B. *are the Maniples of Haſtati.* C. C. *thoſe he Principes.* D. D. *thoſe of the Triarii. The ks which are about the Maniples, repreſent the lites.*

Over every Maniple were two commanders, ed Centurions, a firſt, and a ſecond; when both hem were preſent with their Maniple, the firſt

commanded the right flank, and the second left: and if one of them were absent, he which present commanded the whole Maniple. In ev Maniple were two Ensignes, one under each C turion, and two Sergeants. Every ten men had a commander, called a Decurion, and over all Legion there were six Tribunes or commander chief.

Every Legion had 300 horse, divided into troops called Turmes, every one of which had souldiers, three whereof were Decurions or f leaders, and three bringers-up. The first file- der, called the Prefect, commanded the troop his absence the second, and in eithers absence third did it. In every troop there was a Corne

Three Turmes in a companie.



B. *The file-leaders.*
C. *The three Cornets.*

The Romanes made use of their Allies in t warres, and had a like number of foot of their lies as they had of citizens of Rome, and the gions were alike in form, armes, and numbe men: but concerning the Cavallrie, the A

were double the number of the Romanes. It is true that of the foot they took the fifth part, and of the horse the third part for extraordinarie, and the rest of the foot they divided into two equall parts, which they placed on the flanks of the armie, and called those on the right hand, The right wing, and those on the left hand, The left wing, so that when the Roman Legions consisted of 4200 men, the wings of the Allies were 3360, and the Maniples of the *Hastati* and *Principes*, each of them were 92; of the *Triarii* 60; and of the *Velites* 40. And the troop of extraordinarie foot in every wing was 840 men. The Cavallrie of the Allies for every of their Legions was 600 horse (double the number of the Romanes) of these they took a third part (namely 200) for extraordinarie, and divided the remaining 400 into ten Turmes, each of them of 40 horse, over which there were a Cornet, a Prefect, three Decurions or file-leaders, and three bringers-up, as amongst the Romanes. These extraordinaries were imployed for guards for the Consuls, and for troops of reserve in combats.

When foure Legions were ranged in battaile, all the Roman Cavallrie was on the right hand, that of the Allies on the left hand, and the extraordinarie Cavallrie of the Allies was placed on the right hand of the Roman horse, and the extraordinarie Infanterie of the Allies was ranged between the Legions and the wings, over against the *Triarii*.

Foure Legions ranged in Battalia by Maniples.

A. *The Cavallrie of t*
two Wings of Allie
H. I. K. *The Hastat*
Principes, and Tri
rii of the first R
man Legion.
E. F. G. *The Hastat*
Principes, and Tri
rii of the second R
man Legion.
L. M. N. *The Hastat*
Principes, and Tr
arii of the righ
wing of the Allies.
B. C. D. *The Hastat*
Principes, and Tri
rii of the left wi
of the Allies.
Q. *The two extraor*
dinarie Cohorts
the left wing of t
Allies.
R. *The 2 extraordinar*
Cohorts of the righ
wing of the Allies.
T. *The Imperator*
Genera.
N. *The Legate of th*
right wing
D. *The Legate of th*
left wing.
O *The Cavallrie of th*
two Roman Legions
P. *The extraordinari*
Cavallrie of the Al
lies.

Whe

When the Legion consisted of 4000 men, more leſſe, it was divided according to the aforesaid proportion; as when the Legion contained 5100 men, the *Velites*, *Hastati*, and *Principes*, were each of them 1500, and the Maniples of the *Hastati* and *Principes* 150. Concerning the *Triarii*, they never increased nor diminished their number of 600, nor their Maniples of 60, and the Maniples of the *Velites* were of 50 men a piece.

The Legions have oft-times been augmented; for in *Romulus* his time they contained 3000 foot and 300 horse.

In the time of *Camillus*, they were 4000 foot and 300 horse.

In *Cæsars* time, 5000 foot and 600 horse.

And in the time when the Sabines joyned themselves with the Romanes, it consisted of 6000 foot and 600 horse.

When the armie was thus strong, the Legions were ranged in battalia by Cohorts, and not by Maniples. As when *Cæsar* fought against *Afranius*, he placed in every Legion, foure Cohorts of *Hastati*, three of *Principes*, three of *Triarii*. The *Velites* were about the middle of the armie, and the horse on the flanks.

Five Legions ranged in battalia by Cohorts.

A. B. C. *Ten Cohorts of a Legion.*

D. E. F. *Ten Cohorts of another Legion.*

G. H. I. K. L. M. N. O. P. *are three other Legions, each of them being divided into ten Cohorts.*

R. *The Cavallrie of Allies.*

Q. *The Roman Cavallrie.*

S. *The extraordinary Cavallrie of the Allies.*

T. V. *The extraordinarie Cohorts of the Allies.*

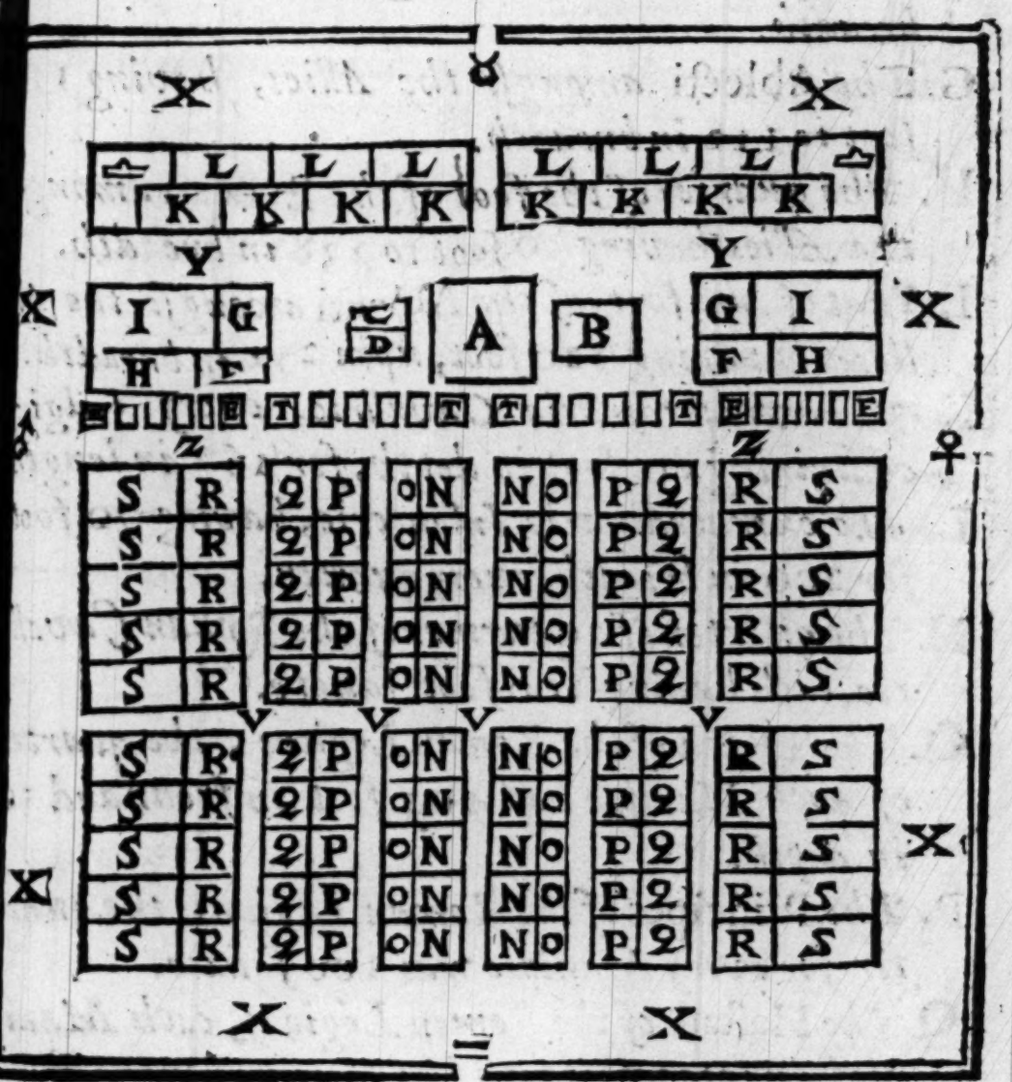
A. *The*

B. *The depth*

Con

Concerning their manner of encamping, it was ſo ſuch as is here ſhewed by a quartering of two oman Legions. And if the armie were greater, ey lengthened the camp on the right and left nd. If there were two armies together, they ade two equall quarters, which they joyned on at ſide of the Pretorian gate.

The quartering of foure Roman Legions.



A. The Pretorie, which contained 200 foot ſquare.
B. The treaſurie, 200 foot long, and 100 foot in depth.

C. D. *The two Legates tents, the ground for ea of which contained 50 foot in depth and 100 length.*

E. *The Prefects over the Allies, whose lodgin were ſquare; each ſide having 150 foot; the tents were 12 in all.*

T. *The Tribunes of two Roman Legions: the lodgings were ſquare, of 150 foot aſide, and tents.*

F. *The lodgings of the Cavallrie of the* Evoca *amongſt the Allies, having 80 foot to 125 breadth.*

G. *The* Ablecti *amongſt the Allies, having 12 foot to 112 in breadth.*

H. *The quarter of the foot of the* Evocati *among the Allies, having 80 foot to 238 in breadth.*

I. *That of the foot of the* Ablecti *amongſt the Allies, containing 120 foot, upon 25 in breadth.*

K. *The extraordinarie Cavallrie, every lodgin containing 80 foot in depth, for 167 in length*

L. *The extraordinarie Infanterie, having 70 foot for 200 in breadth, every quarter.*

N. *The quarter of 20 turmes of the Roman Cavall rie, each having 100 foot ſquare.*

O. *The* Triarii *of the Roman Legions; the quarter of each Maniple had 100 foot in front and 50 in depth.*

P. *The* Principes *of the Roman Legions; the quarter for every Maniple was 100 ſquare.*

Q. *The* Haſtati *of the Roman Legions, each Maniples quarter was 100 foot ſquare.*

R. *The Cavallrie of the Allies; the quarter for their turmes was 34 foot in length and 100 broad.*

S. *All the Infanterie of the Legions of the Allies, every*

every Cohort having 100 foot in front and 200[a] in depth.

. The streets, being 50 foot broad.

. The alarm-place, being 200 foot broad.

. Z. Two streets, each of them being 100 foot broad.

. The Pretorian gate.

. The right hand gate.

. The left hand gate.

. The Decumane gate.

. Void places reserved to lodge strangers.

[a] Observe that from the Decumane gate there runneth a street, which divideth the two Legions, which have all their

arters facing outward, and their backs meeting at that street, both nting to their alarm-places X.

The

The manner of forming all ſorts of battaillons.

CHAP. XVIII.

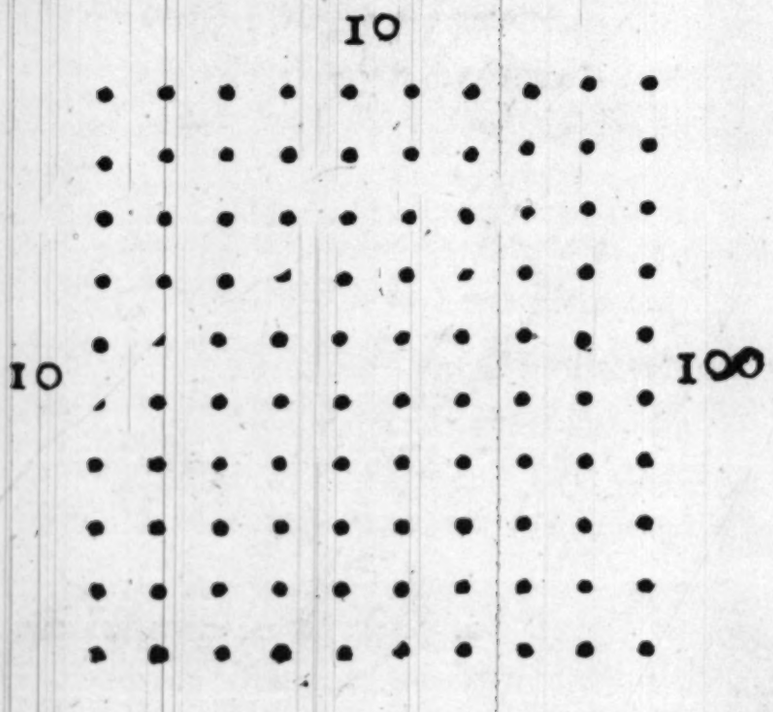
The authour followeth other writers in this chapter, which ſome (ſince) have alſo retained; but are (in my opinion) of little uſe, and ſavour of curious impertinenci

FIve ſorts of battaillons are ordinarily made namely, ſquare of men, ſquare of ground, doubled, when the front is to the depth according to proportion given, and the broad fronted battalion.

The ſpace which every ſouldier requireth marching in battalia, is three foot in front and ſeven in depth.

To make a battaillon ſquare of men.

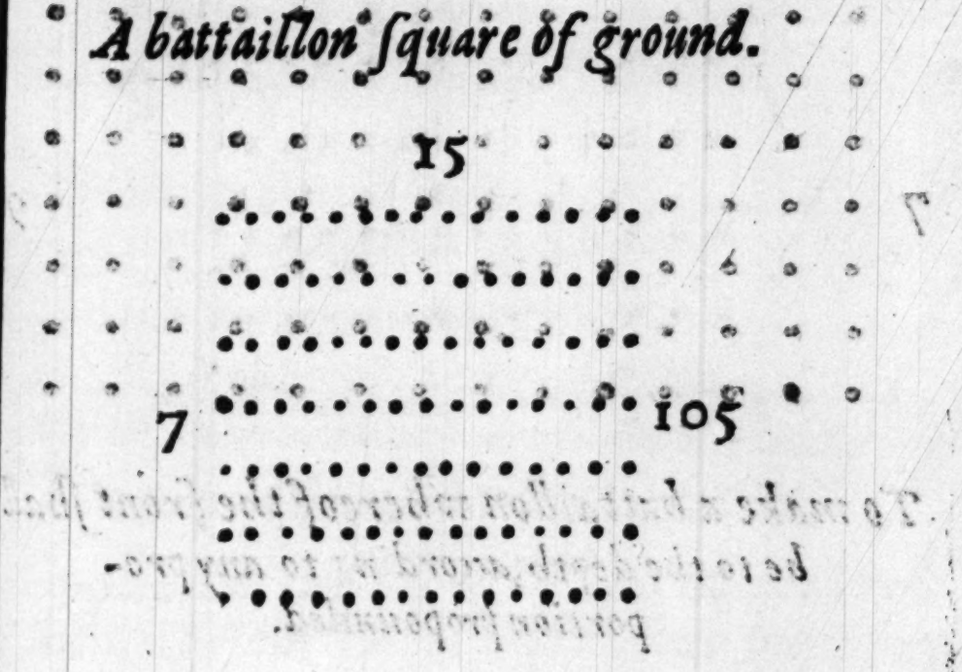
Suppoſe the number of men be 100, take the ſquare root of 100, which is ten, which is the number of men which muſt be placed in front, and alſo in flank; As in the figure following.



To make a battaillon ſquare of ground.

Suppoſe the number be 105 men, multiply it three (which is the ſpace which every man upieth in front) it will produce 315 ; divide s number by 7 (which is the ſpace which a man uireth in depth) it will produce 45. Take the reſt ſquare root to this number, which is 7, and t is the number of men which muſt ſerve for ur files. After this divide your 105 men by 7, will produce 15, which is the number for the nt : ſo that this battaillon for every 7 men in nt, hath 3 in flank.

A battaillon ſquare of ground.



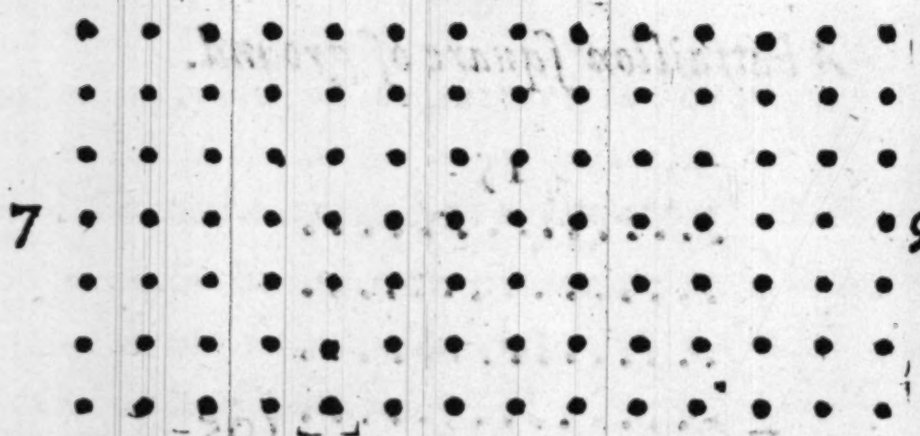
To

To make a doubled battaillon, that is, which hath twice as many men in front as in depth.

Suppose the number be 98 men, double the number, then will be 196. take the square root of this number, which is fourteen, and that is the number of men which must be in front, and the half of that, which is seven, must be placed in the depth.

A doubled battaillon.

14



To make a battaillon whereof the front shall be to the depth, according to any proportion propounded.

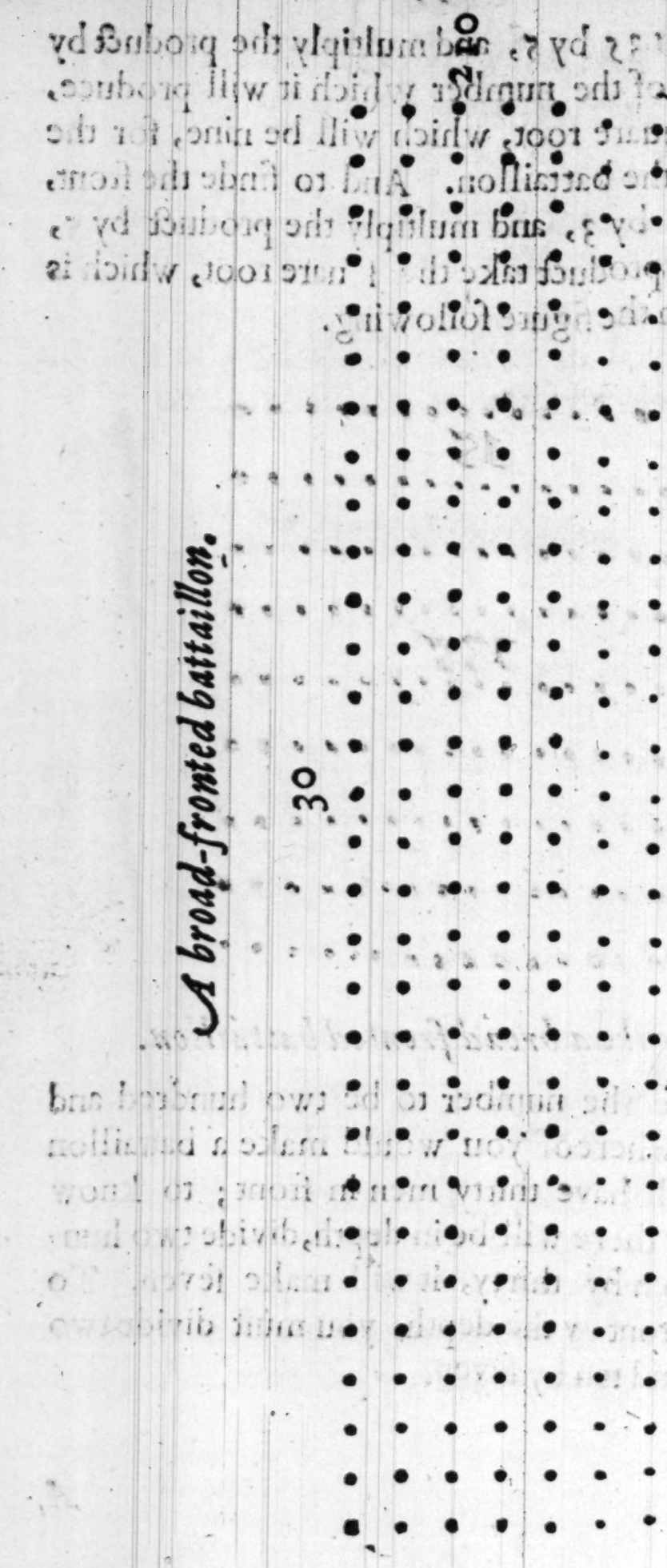
Suppose the number be 135 men, to be ranged in battalia in such manner, that for every 5 which shall be in front, there be three in depth, that is that there be a proportion between that and the flanks, as between three and five.

Divide 135 by 5, and multiply the product by ree, and of the number which it will produce, ke the ſquare root, which will be nine, for the epth of the battaillon. And to finde the front, ivide 135 by 3, and multiply the product by 5, d of the product take the ſquare root, which is feen, as in the figure following.



To make a broad fronted battaillon.

Suppoſe the number to be two hundred and n men, whereof you would make a battaillon hich ſhall have thirty men in front; to know ow many there will be in depth, divide two hun-ed and ten by thirty, it will make ſeven. To nde the front by the depth, you muſt divide two ndred and ten by ſeven.



A broad-fronted battaillon.

The ſquare battaillons (of men or ground) are weak of front, and thoſe of broad front are weak in depth. The Spaniards often uſe doubled battaillons. And the Hollanders broad fronted ones, for they make their files no deeper then [a] ten men.

[a] *Seeing that not onely the Hollanders, but all others, make not their files to exceed the number of ten (ſome be but eight, and the Swedes uſe but ſix) to what purpoſe ſhould the ſquare root ſerve, eſpecially in a great body?*

To finde the ſquare root, to the number of 4096.

To finde the ſquare root of a number, as if you were to make a ſquare battaillon of 1600 men, looke in the table following in the column of ſquares 1600, and you ſhall finde over againſt it in the column of roots 40, for the root or number of men which muſt be placed on all ſides of the battaillon.

A table to finde the square root to the number of 4096.

Squares.	Roots.	Squares.	Roots.	Squares.	Roots.
4	2.	529	23.	1939	44.
9	3.	576	24.	2025	45.
16	4.	625	25.	2116	46.
25	5.	676	26.	2209	47.
36	6.	729	27.	2304	48.
49	7.	784	28.	2401	49.
64	8.	841	29.	2500	50.
81	9.	900	30.	2601	51.
100	10.	961	31.	2704	52.
121	11.	1024	32.	2809	53.
144	12.	1084	33.	2916	54.
169	13.	1156	34.	3025	55.
196	14.	1225	35.	3136	56.
225	15.	1296	36.	3249	57.
256	16.	1369	37.	3364	58.
289	17.	1444	38.	3481	59.
324	18.	1521	39.	3600	60.
261	19.	1600	40.	3721	61.
400	20.	1681	41.	3844	62.
441	21.	1764	42.	3969	63.
484	22.	1849	43.	4096	64.

FINIS.

Vpon the accurate tranſlation of the Lord *Du Praiſſac* his Militarie diſcourſes, done by his eſteemed friend Captain JOHN CRUSO.

TImes have their Genii: *yea; and Places too.*
For contemplation ſome are; ſome to do.
That Laurell, which ha's crown'd Aſtræa's head,
lay to Bellona's *front be altered.*
Arts have their times too. In that ſeaſon ſing
he Muſes nine about their dancing ſpring:
Another while much fitter Muſick are
hoſe ſterner arts, that teach us how to warre:
Happie that age, that can ſo much foreſee,
o ſtudy warre in her tranquillitie.)
hat Amazonian offſpring, which doth ſit
ear Pallas *ſtrength, and near* Minerva's *wit.*
heſe teach the needfull uſe of Armes to know;
o march by their field-muſick quick, or ſlow;
o ſit down 'fore a town; T'encamp in field;
ow to embattail; And how forts to build;
aſſault; defend; To famine; force; ſurprize;
ow to releeve beſieg'd; void treacheries;
And (that which makes commanders worths grow high)
ow ſtratagems to make; and how t'apply:

Of theſe the Lord Praiſſac *the skill hath ſhown:*
(So Greatneſſe by her vertues beſt is known)
To fortifie; To make a Canonier;
To contrive fireworks are directed here;
And, leſt th'unpractick off'cer of a Band
Should know his title, but not underſtand
His place, and dutie, he hath tane ſome pain
To teach. 'Twere hard, his labour ſhould prove vain;
And moſt induſtrious Cruſo *looſe his end,*
That to the ſtate did ſo much oyl intend.
He, that hath but the language, boldly may
Seek to tranſlate, yet is but half the way.
Who renders Sence for Sence, and Words of Art
Does properly expound, does act the Part.
Praiſſac *is well-come into England. We*
May joy in him: But yeeld our thanks to Thee.

W. Denny Eſq. Serg. Ma

To his very worthie friend Captain John Cruso.

COuld I command an Armie forth, & train
Inventions Forces, had I a Martiall vein:
I would lay ſiege to Cenſure, and ſurpriſe
The ſtrongeſt Fortreſſe Envie could deviſe
To raiſe againſt thee, *Momus* force to yeeld,
And leave thy judgement Maſter of the field.

Had

Hadſt thou vouchſafed onely to impart
he *Centaures* skill, and the *Theſſalian* Art;
ad I but known thee in thy Cavallrie
hat dim-ey'd *Alian* ſpi'd not to deſcrie,
nd, where *Walhauſen* faild, to bring to light
hat *Baſta* wanted and the* *Malta* Knight: *Luys Melzo.*
n oath had gone for't, *Cruſo* to beget
Mars with *Minerva* inceſt did commit.
But when I further ſee the Infantrie
ommanded by thee, and th' Artillerie;
ke, halbert, partizan, musket, carbine,
he faulcon, minion, canon, culverine:
orts rais d, by ſiege cities environed,
ncamped Armies, and embattailed:
e thinks that God of warre which heretofore
How e're Great Greece and Rome did him adore)
ut an Apprentice was, at length by thee
Maſter of his trade, and now made free,
Nor is t ſufficient to ſet *Praiſſac*'s name
efore thy book as authour to the ſame.
know thou can'ſt not like a cipher be,
nleſſe anothers worth to decuply.
nd this thou haſt done. For it will be ſaid,
was *writ* by *Praiſſac*, but by *Cruſo made.*
ay, Poets Prophets are. In time to come
hey'l ſay, Thou ſtol'ſt *France*'s *Palladium.*
ill then I'le ſtile thee (and not think I erre)
he warlike *Hermes*, *Mars*'s Interpreter.

Ri. Watſon Col. Gon. & Cai. ſoc.

Ad

Ad digniſsimum virum & de re mi
litari optimè meritum *Johannem Cruſo*, hujus operis *Interpretem*, factâ primùm ad *Galliam* Apoſtrophe.

GAllia, *quid noſtras armato milite comples*
Oras, belligeri prodiga terra Dei?
Non ità dividuam concors alit Anglia *pacem,*
Non eſt, ut vires ambiat illa tuas.
Non ita de proprio diffidit Marte, *triumphat*
Unica præſidiis imperioſa ſuis.
Veſtra vel adverſas ſi vis juvet invida partes,
Sentiet emeritam lis rediviva manum.
Interea non culpo tuos Cruſoe *labores:*
Id dubito, ars major ſit tua ſitve fides.
Illa, vel extremi recoletur limite mundi,
Hæc intrà patriæ limina nota tuæ.
Quæ, cum per multos tranquilla quieverit annos,
Sera capit Scoticæ *pignora perfidiæ.*
At ne fortè manu infelix agitata rebellì
Concidat, externi militis addis opem.
Quin age, ſiqua latet Germano *ſanguine parta*
Ars, ſit & huc genii flumine ducta tui.
Imò & ab Hiſpanis *referat tua dextera bellis,*
Militiæ jactant quæ bene geſta ſuæ.
Sic olim, Angliacâ *meritos referente triumphos,*
Singula gens proprio Marte *vel* Arte *cadat.*

Guil. Sigiſwicke ſoc. Caio-Gon

A ſhort METHOD FOR THE EASIE RESOLVING OF ANY Militarie Queſtion propounded.

By

The Lord of PRAISSAC.

Engliſhed by *I. C.*

CAMBRIDGE:

Printed by ROGER DANIEL, Printer to that famous UNIVERSITIE.

1639.

To the worshipfull, my worthily honoured friend PHILIP SKIPPON Esquire, Captain of a Companie of foot, in service of the *States* of the united Provinces.

SIR,

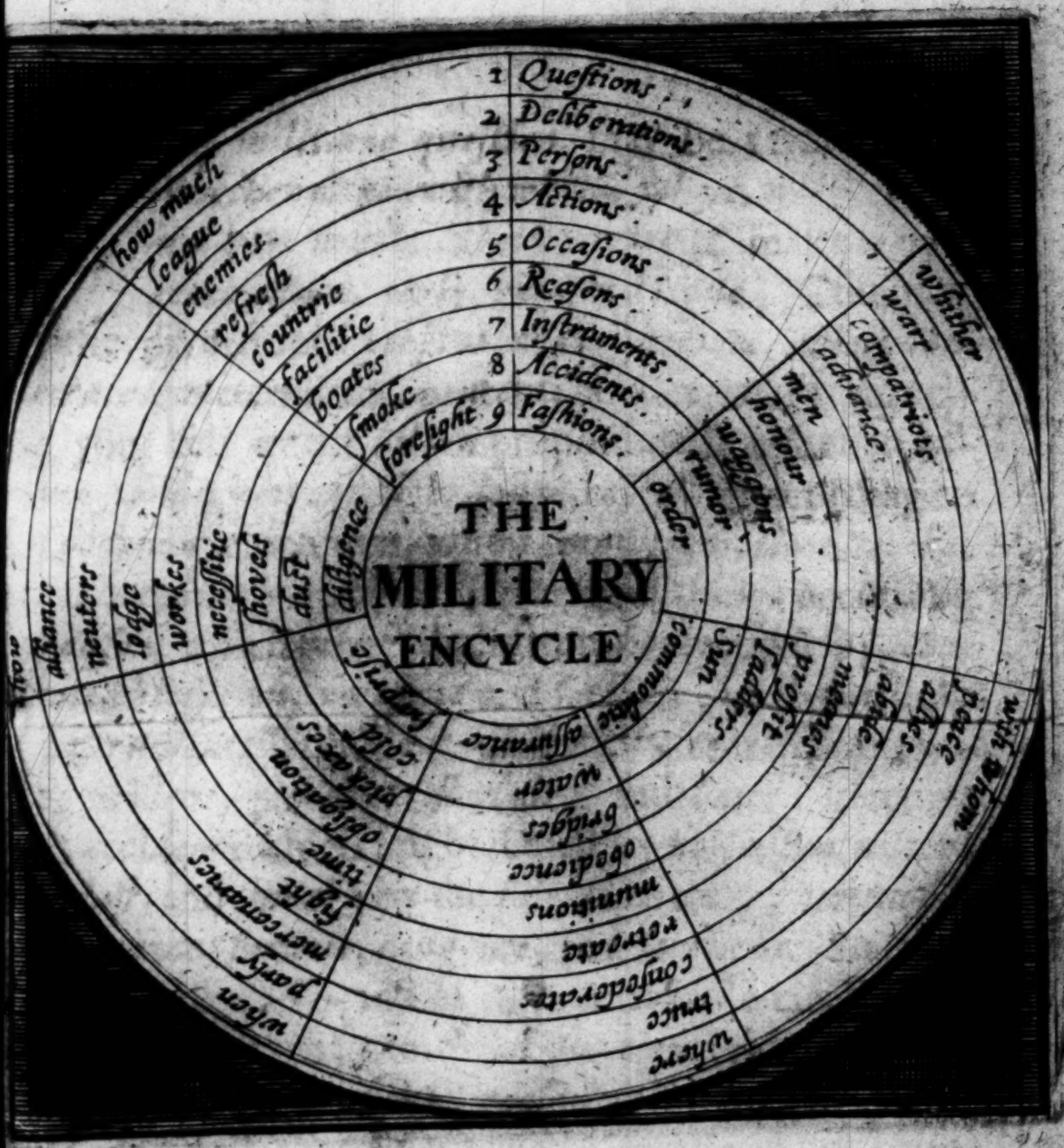
IT pleased you to put me upon the translation of the Lord of *Praissac's discourses*, and (afterwards) of this last piece of his; which I conceive he intended, as a *Corollarium* to conclude with; or as an *Epitome* of his other tractes, to put his readers to trie what they had profited by them, by setting these wheels awork. These are no speculations for every *Tyro* to meddle with; but rather for such as had followed your Worthie self in your foure and twentie years *Militia* (in *Denmark*, *Germanie*, the *Low Countries* and elsewhere) to exercise their thoughts in; and to recollect those things which might (perhaps) be slipped out of memorie. I cannot compare this piece to any thing better (for so much matter in so small a room) then to that admired artificiall *Flie*, made by that famous *German* man. *De monte regio*, (celebrated by divine *du*

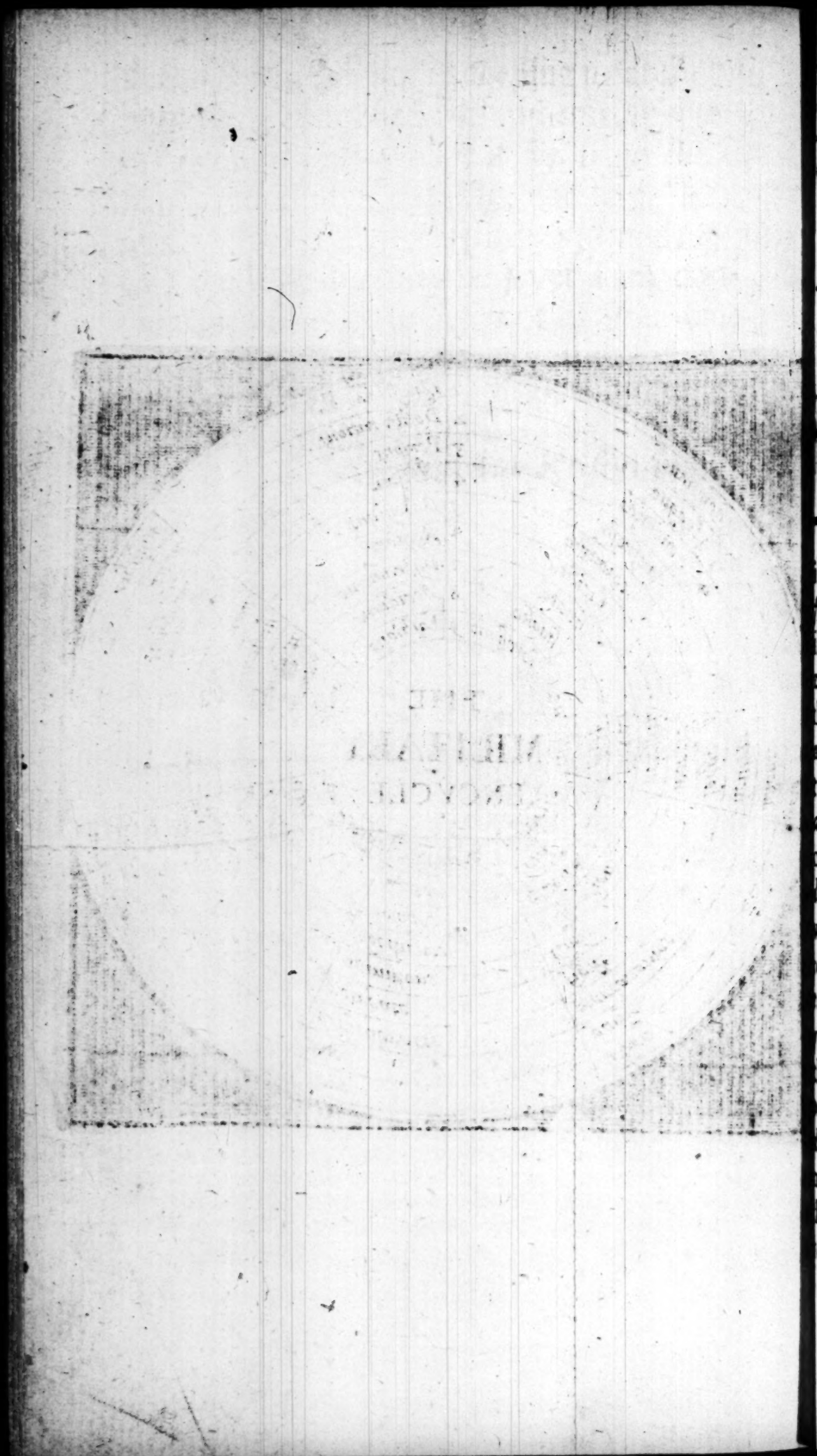
Bartas) which (not exceeding a naturall fly in bigneſſe) contained ſuch wheels, ſprings, and other engines, as made it fly from the artiſts hand round about a table, and ſo to his hand again. As little as this piece is, (and my pains in it the leaſt that may be) yet I am confident (having ſo much experience of your true candor and ſweet diſpoſition) you will dain to accept of it, from

your humble ſervant

I. C

A


THE
MILITARY
ENCYCLE
1 Questions.
2 Deliberations.
3 Persons.
4 Actions.
5 Occasions.
6 Reasons.
7 Instruments.
8 Accidents.
9 Fashions.
how much
league
enemies.
refresh
countrie
facilitie
boates
smoke
foresight
diligence
dust
shovels
necessitie
workes
lodge
neutors
alliance
order
rumor
waggons
mtn
honour
advance
companions
whither
warr
when
party
mercenaries
fight
time
obligation
pitch aces
cold
spirits
assurance
water
bridges
obedience
munitions
retreate
confederates
truce
where
commodie
sum
leaders
profit
means
able
aces
peace
with honor



A SHORT METHOD,

for the easie resolving of any *Militarie question* propounded.

EVery *militarie question* may be resolved by, *Whether or no, with whom, where, when, how, and how much. Deliberating* to make *warre, peace, truce, parly, alliance, league*; Considering the diversitie of *persons*, as *compatriots, allies, confederates, mercenaries, neuters*, and *enemies*; directing your self in the *action* propounded, either to *advance, abide, retreat, fight, lodge, refresh*; according to the *occasion* which *men, means, munitions, time, works*, and the *countrey* do afford; doing all things according to *reason*, which proceedeth from *honour, profite, obedience, obligation, necessitie* and *facilitie*; using the help of *instruments* fitting for execution, as *waggons, ladders, bridges, pickaxes, shovels*, and *boats*; meeting with *accidents* which might befall by *noise, sun, water, cold, dust*, and *smoak*; by the *fashion* of *order, commoditie, assurance, surprise, diligence*, and *foresight*. So that you may make an *encycle* of nine moveable circles (as the figure sheweth) namely of *questions, deliberations, persons, actions, occasions, reasons, instruments, accidents*, and *fashions*. Every circle containeth six common places, the greatest is called the first, and the least the ninth. If you turn the second circle with a whole revolution, upon each common place of the first, you

ſhall finde 36 queſtions, as, *Whether you ought to make warre, whether you ought to make peace, whether you ought to make truce, whether you ought to parly, whether you ought to make alliance, whether you ought to make league. With whom you ſhould make warre, with whom you ſhould make peace, with whom you ſhould make truce, with whom you ſhould parly, with whom you ſhould make alliance, with whom you ſhould make league. Where you ſhould make warre, where you ſhould make peace, where you ſhould make truce, where you ſhould parly, where you ſhould make alliance, where you ſhould make league. When you ſhould make warre, when you ſhould make peace, when you ſhould make truce, when you ſhould parly, when you ſhould make alliance, when you ſhould make league. How you ſhould make warre, how you ſhould make peace, how you ſhould make truce, how you ſhould parly, how you ſhould make alliance, how you ſhould make league. How much you ſhould make warre, how much you ſhould make peace, how much you ſhould make truce, how much you ſhould parly, how much you ſhould make alliance, how much you ſhould make league.* And if you turn the third circle even as the ſecond, you ſhall finde that the ſaid 36 queſtions being joyned to the ſix common places of the ſaid circle, will produce 216. Namely, *Whether you ſhould make warre with your compatriots, whether you ſhould make peace with your compatriots, whether you ſhould make truce with your compatriots,* &c. Theſe 216 queſtions are reſolved by the common places of the fifth, ſixth and ninth circles.

If you have concluded to make warre, the queſtions to be propounded about the *actions* thereof, are to be taken out of the firſt and fourth circles, which will produce 36 propoſitions (as was ſaid of the firſt and

ſecond) namely, *Whether you ought to advance forward, whether you ought to abide ſtill, whether you ought to retreat, whether you ought to fight, whether you ought to lodge, whether you ought to refreſh. With whom you ſhould advance, with whom you ſhould abide, with whom you ſhould retreat, with whom you ſhould fight, with whom you ſhould lodge, with whom you ſhould refreſh. Where you ſhould advance*, &c.

The affirmation of the 36 laſt propoſitions is taken from the common places of the fifth, ſixth, ſeventh, eighth, and ninth circles. Now, that theſe common places may be ſufficient to afford reaſons for the confirmation of theſe propoſitions, the following example will teſtifie, and will give inſtruction for the order which muſt be obſerved, for the reſolving of other queſtions propounded.

The firſt queſtion is, *Whether you ſhould make warre?* whereupon you muſt conſider of the *reaſon* which you have ſo to do; whether it be *honour*, as to conſerve your own, to maintain another, to ſettle juſtice, to puniſh evill doers. Whether it be *profit*, as to raiſe your ſtate, to augment your dignities, to gather wealth, to advance your friends. Whether it be *obedience* due to the Soveraigne, or to thoſe which himſelf or the laws have ſet over us. Whether it be *obligation*, being bound thereunto either by equitie, or oath, or conſanguinitie, or alliance. Whether it be *facilitie*, as to reſiſt the aſſaults of the enemie, to uſurpe his dominions, and to bring him under ſubjection in ſhort time, and with little charge.

Having conſidered of the *reaſon* you muſt come to the *occaſion*, which may be either in reſpect of *men*, which are either plebeians or militarie. Concerning the plebeians (if it be in a free ſtate, and not a monar-

chie) to know whether they will consent and approve of the *action*, furnish men for the warre, deliver places for securitie, money to bear all the charges, and submit themselves to your judgement and discretion. Concerning the militarie men, whether they be willing to obey you, deliver you hostages, and put their fortunes, goods, and honours into your hands.

Now for the regard of *means*, as whether you have good store of money beforehand, or means to get it, by favour of friends, or to take it from your enemies, making warre at his charge, or having good store of auxiliaries from your allies, and means to pay them.

And in respect of *munitions*, whether you have abundance of victuall, as well for the provision of cities, as for the feeding of the armies, magazines well stored, great store of draught horses for the ready drawing of the train where it shall be needfull.

Or in regard of the *time*, whether it be when there is a dissention, fomenting one of the parties; in the minoritie of the Soveraigne, insinuating with his officers; in the midst of a profound peace, when there is no doubt of combinations, when a great mortalitie rageth amongst the enemies, and famine weakneth them; or when you conceive that the fear of warre will constrain them to give you more then you could get by it.

Or in respect of the *works*, whether you possesse strong cities, assured havens, and well fortified cittadels.

Or in regard of the *countrey*, whether you possesse the straits, the key sides, bridges, that so you may facilitate the entrance of your relcefs, and easily to joyn your self to them, and by that means be master of the field, possessing so much of the countrey as you are able

able to guard, and abandoning that which you could not be able to maintain, and whereof the coſt would ſurpaſſe the profit.

Concerning the *faſhion* of proceeding, it is taken from the *order* which you muſt obſerve before you execute any thing; as whether you ought to begin, or to give occaſion to the enemie to do it, in what place you ſhould give the firſt aſſault, in what ſtaple towns; and if it ſhould be ſo, how you ſhall march thither, with what quantitie of Infanterie, Cavallrie, and Artillerie you ſhould execute the enterpriſe; whether you be able to do it alone, or whether you muſt call your friends to help you; who (amongſt all) ſhall begin, who ſhall do the exploit, who ſhall conſerve that which ſhall be gotten.

Then what commoditie you ſhall reap thereby, whether you ſhall be in peace afterwards, or the nobilitie be better pleaſed, the church more flouriſhing, juſtice better adminiſtred, the people leſſe burthened, the King better ſerved, the ſtate better ſecured; what *commoditie* will facilitate the enterpriſe, will it be vicinitie, will it be the weakneſſe of the enemie, of his countrey, of his people, of his towns, of his bad counſell, of his diſorder in his actions, or that you have no want of any thing.

What *Aſſurance* have you that the execution will ſucceed according to your deſire; and if that be wanting, how ſhall you aſſure your affairs; will you hazard all your fortune at a time, will you play at double or quit, or will not that which you undertake be able to hurt you but in part, or but little, or nothing at all, neither to your ſelf nor your friends.

Shall you *ſurpriſe* your enemie at unawares, keeping all guard in his cities, or being weakly followed in the field,

field, at a time when he is ſolacing himſelf either wit
courting or hunting, and without being able to b
advertiſed of your deſigne, untill he be fallen into you
hands?

Can you by your *diligence* prevent his knowledge
and ſo your own obſtacles and his remedies?

Have you *foreſeen* whatſoever may befall you, a
well in your deſigne, in the action, and after the execu
tion thereof, to prevent the miſchief, and to advantag
your ſelf by the good thereof? will your confederate
be faithfull to you? If falſe, ſhall they be able to hin
der the enterpriſe in the whole or onely in part, or i
your very perſon, by ſeizing thereon and delivering you
into the enemies hands? and if they can, by what de
vice ſhall you be able to eſcape them? If the thing
aboveſaid be ſo advantageous as you ought to conclud
for warre, you muſt then come to the other queſtion
with whom you ought to make it, whether with you
compatriots, or with your *allies*, or *confederates*, &c. an
to ſee the *reaſon*, the *occaſion*, and *faſhion* by which yo
ſhould proceed, paſſing through all theſe commo
places.

That done, you muſt handle the queſtions which
concern the *action*, which are, *whether or no*, *with
whom*, *where*, *when*, *how*, and *how much* you ſhal
do that which you have concluded (as hath bee
ſhewed in the firſt queſtion:) as if a generall had cauſe
his armie to be muſtered, he ſhall deliberate wherein
to imploy it, as *whether* he ſhould cauſe it to *advance*,
or *abide*, or *fight*, &c. Suppoſe *if he ought to cauſe hi
armie to march*, he ought to do it when it is to figh
with the enemie, to hinder him from paſſing a cham
pain, a river, a ſtrait, to cut off his releef; or for his
own effecting of theſe things, or to beſiege ſome place;

to

o releeve it, to cut off a convoy, or to conſerve, or pil-
age the open countrey.

You muſt *advance*, when your *abiding* or *retreat* would be diſhonourable, when the hope of the *profit* s great, when ſuperiours *command* it, when alliance *blige* you to it, when *neceſſitie* conſtrains you there-nto, and when the thing is ſo *facile* as nothing can op-oſe you.

That which will *occaſion* your moving, will be the dvantage of *men*, be it on foot or horſeback; of *eans*, as money, waggons, artillerie; of *munitions* oth for the mouth and for warre; the commodiouſ-neſſe of *time*, fair, cold, or rain. Of the *works*, as forts, renches, redouts. Of the *countrey*, as large, ſpacious, nd even, to range your battaillons and ſquadrons; or loſe and mountainous, to paſſe undiſcovered and heltred. The *inſtruments* which may facilitate the deſigne, are *waggons* to carrie the munitions; *ladders* to ſerve for ſurpriſes; *bridges* to paſſe over moats and ri-vers, *pickaxes* and *ſhovels* to make the trenches and other works, and *boats* to paſſe rivers. The *accidents* which you ought to foreſee, are the *noiſe* which hin-dreth the ſouldiers from hearing the orders, and af-frighteth them; the *ſunne*, which may dazle them; the *water* of pools, moors or rain, which may diſcom-mode you; the *cold*, which may put your ſouldiers out of caſe to fight; the *duſt* raiſed in the field by the footing; and the *ſmoak* of firings, which hinders you from ſeeing the battaillons, and the actions of the ene-mie. After that, you muſt conſider the *faſhion* of your march, what *order* your Infanterie ſhall obſerve, what your Cavallrie, and what your Artillerie; what com-moditie this marching will afford you, whether it will advantage you, and whether you ſhall be the better for

it

it in the whole or in part. Wherein your *assurance* will be, whether in your enemies being farre off, or in the strength of your site, or of the territorie, or vicinitie of friends; whether you must march upon *surprise* in the night, to pillage; with such *diligence* as you may be farre before you be discovered; *foreseeing* for all things necessarie, as to be able to make resistance, being charged; to arrive timely, before the danger; to be strongly and commodiously encamped, in such sort as you may not fear neither the surprises of the enemie, nor the violence of his assaults.

These common places may be applied as well to divers other actions as to that of warre, provided that you know which to choose, and how many.

FINIS.